SOLICITATION, OFFER AND AWARD

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)	RATING	PAGE OF PAGES
		1 | 92

2. CONTRACT NO.	3. SOLICITATION NO.	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NO.
	N00174-05-R-0018	[ ] SEALED BID (IFB) [X] NEGOTIATED (RFP)	04 Feb 2005	

7. ISSUED BY	CODE	8. ADDRESS OFFER TO (If other than Item 7)	CODE
NAVSEA INDIAN HEAD 101 STRAUSS AVE. ATTN: BRENDA PRICE 1143B BRENDA.PRICE@NAVY.MIL INDIAN HEAD MD 20640-5035 TEL: 301/744-6570 FAX: 301/744-6670	N00174	See Item 7 TEL: FAX:	

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

SOLICITATION

9. Sealed offers in original and 0 copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in BLDG 1558 until 03:00 PM (Hour) local time 07 Mar 2005 (Date)

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE (Include area code) *(NO COLLECT CALLS)*	C. E-MAIL ADDRESS

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OFFER (Must be fully completed by offeror)

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52.232-8)	

14. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated):	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE

15A. NAME AND ADDRESS OF OFFEROR	CODE	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)

15B. TELEPHONE NO (Include area code)	15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.	17. SIGNATURE	18. OFFER DATE
	☐		

AWARD (To be completed by Government)

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: ☐ 10 U.S.C. 2304(c)( ) ☐ 41 U.S.C. 253(c)( )	23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)	ITEM

24. ADMINISTERED BY (If other than Item 7)	CODE	25. PAYMENT WILL BE MADE BY	CODE

26. NAME OF CONTRACTING OFFICER (Type or print) TEL: EMAIL:	27. UNITED STATES OF AMERICA (Signature of Contracting Officer)	28. AWARD DATE

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

LOT I, BASIC REQUIREMENT

0001MEETINGS AND REVIEWS

0001AA	PRESUBMITTAL POST AWARD CONFERENCE IN ACCORDANCE WITH (IAW) SECTION C, STATEMENT OF WORK	1 LO	$NSP	$NSP
0001AB	PRELIMINARY DESIGN REVIEW (PDR) IAW, SECTION C, STATEMENT OF WORK	1 LO	$	$
0001AC	CRITICAL SESIGN REVIEW (CDR) IAW, SECTION C, STATEMENT OF WORK	1 LO	$	$

0002	**HELICOPTER TURBINE ENGINE TEST CELL CAPACITY UPGRADE, IAW SECTIONC, STATEMENT OF WORK**			
002AA	SAME AS LINE ITEM 0002	1 LO	$	$

0003	**STANDARD WARRANTY INCLUDING TWO (2) YEAR REPAIR AND PREVENTATIVE MAINTENANCE, IAW SECTION C STATEMENT OF WORK**			

0003AA	SAME AS LINE ITEM 0003	1 LO	$	$
0004	**TRAINING IAW SECTIONC, STATEMENT OF WORK**			
0004AA	CONTROL SYSTEM TRAINING IAW SECTION C, STATEMENT OF WORK	1 LO	$	$
0004AB	PREPARATORY TRAINING IAW SECTION C, STATEMENT OF WORK	1 LO	$	$
0004AC	OPERATIONAL TRAINING IAW SECTION C, STATEMENT OF WORK	1 LO	$	$
0004AD	CONFIGURATION TRAINING IAW SECTION C, STATEMENT OF WORK	1 LO	$	$
0004AE	OPERATOR/MAINTENANCE TRAINING IAW SECTIONC, STATEMENT OF WORK	1 LO	$	$
0004AF	AUTOMATIC TESTING SEQUENCE TRAINING IAW SECTION C, STATEMENT OF WORK	1 LO	$	$
0004AG	TEST EVALUATION AND ARCHIVE SYSTEM TRAINING IAW SECTION C, STATEMENT OF WORK	1 LO	$	$
0004AH	CALIBRATION TRAINING IAW SECTION C, STATEMENT OF WORK	1 LO	$	$

0005	**DOCUMENTATION IAW SECTION C, STATEMENTOF WORK AND DD 1423'S**			
0005AA	DRAWINGS SAME AS LINE ITEM 0005	1 LO	$	$
0005AB	MANUALS SAME AS LINE ITEM 0005	1 LO	$	$
0005AC	OPERATION AND MAINTENANCE MANUALS SAME AS LINE ITEM 0005	1 LO	$	$
0005AD	SOFTWARE SAME AS LINE ITEM 0005	1 LO	$	$

0006 SPARE PARTS

PROVIDE A ONE-YEAR SUPPLY OF ALL COMSUMABLES REQUIRED TO OPERATE THE TEST CELL FOR A ONE-YEAR PERIOD, IAW SECTION C, STATEMENT OF WORK

0006AA	SPARE PARTS SAME AS LINE ITEM 0006	1 LO	$	$

0007 REMOTE DIAGNOSTICS

PROVIDE REMOTE DIAGNOSTICS, FOR A PERIOD OF TWO YEARS IAW SECTION C, STATEMENT OF WORK

0007AA	REMOTE DIAGNOSTICS SAME AS LINE ITEM 0007	1 LO	$	$

LOT II, OPTION I

0008 REPAIR AND PREVENTATIVE

MAINTENANCE IAW SECTION C, STATEMENT OF WORK

0008AA	REPAIR AND PREVENTATIVE MAINTENANCE, SAME AS LINE ITEM 0008	1 LO	$	$

0009 SPARE PARTS

PROVIDE ONE-YEAR SUPPLY OF ALL CONSUMABLES REQUIRED TO OPERATE THE TEST CELL FOR A ONE-YEAR PERIOD, IAW SECTION C STATEMENT OF WORK

0009AA	SPARE PARTS SAME AS LINE ITEM 0009	1 LO	$	$

0010 REMOTE DIAGNOSTICS

PROVIDE REMOTE DIAGNOSTICS IAW SECTION C, STATEMENT OF WORK

0010AA	REMOTE DIAGNOSTICS SAME AS LINE ITEM 0010	1 LO	$	$

LOT III, OPTION II

0011 REPAIR AND PREVENTATIVE

MAINTENANCE IAW SECTION C, STATEMENT OF WORK

0011AA	REPAIR AND PREVENTATIVE MAINTENANCE, SAME AS LINE ITEM 0011	1 LO	$	$

0012 SPARE PARTS

PROVIDE ONE-YEAR SUPPLY OF ALL CONSUMABLES REQUIRED TO OPERATE THE TEST CELL FOR A ONE-YEAR PERIOD, IAW SECTION C STATEMENT OF WORK

0012AA	SPARE PARTS SAME AS LINE ITEM 0012	1 LO	$	$

0013 REMOTE DIAGNOSTICS

PROVIDE REMOTE DIAGNOSTICS IAW SECTION C, STATEMENT OF WORK

0013AA	REMOTE DIAGNOSTICS SAME AS LINE ITEM 0013	1 LO	$	$

LOT IV, OPTION III

0014 REPAIR AND PREVENTATIVE

MAINTENANCE IAW SECTION C, STATEMENT OF WORK

0014AA	REPAIR AND PREVENTATIVE MAINTENANCE, SAME AS LINE ITEM 0014	1 LO	$	$

0015 SPARE PARTS

PROVIDE ONE-YEAR SUPPLY OF ALL CONSUMABLES REQUIRED TO OPERATE THE TEST CELL FOR A ONE-YEAR PERIOD, IAW SECTION C STATEMENT OF WORK

0015AA	SPARE PARTS SAME AS LINE ITEM 0015	1 LO	$	$

0016 REMOTE DIAGNOSTICS

PROVIDE REMOTE DIAGNOSTICS IAW SECTION C, STATEMENT OF WORK

0016AA	REMOTE DIAGNOSTICS SAME AS LINE ITEM 0016	1 LO	$	$

CLAUSES INCORPORATED BY REFERENCE

252.232-7003	Electronic Submission of Payment Requests	JAN 2004

CLAUSES INCORPORATED BY FULL TEXT

HQ B-2-0004 - EXPEDITING CONTRACT CLOSEOUT (NAVSEA) (DEC 1995)

(a) As part of the negotiated fixed price or total estimated amount of this contract, both the Government and the Contractor have agreed to waive any entitlement that otherwise might accrue to either party in any residual dollar amount of $500 or less at the time of final contract closeout. The term "residual dollar amount" shall include all money that would otherwise be owed to either party at the end of the contract, except that, amounts connected in any way with taxation, allegations of fraud and/or antitrust violations shall be excluded. For purposes of determining residual dollar amounts, offsets of money owed by one party against money that would otherwise be paid by that party may be considered to the extent permitted by law.

(b) This agreement to waive entitlement to residual dollar amounts has been considered by both parties. It is agreed that the administrative costs for either party associated with collecting such small dollar amounts could exceed the amount to be recovered.

HQ B-2-0017 - REFUNDS (SPARES AND SUPPORT EQUIPMENT) (NAVSEA) (SEP 1990)

(a) In the event that the price of a spare part or item of support equipment delivered under this contract significantly exceeds its intrinsic value, the Contractor agrees to refund the difference. Refunds will only be made for the difference between the intrinsic value of the item at the time an agreement on price was reached and the contract price. Refunds will not be made to recoup the amount of cost decreases that occur over time due to productivity gains (beyond economic purchase quantity considerations) or changes in market conditions.

(b) For purposes of this requirement, the intrinsic value of an item is defined as follows:

(1) If the item is one which is sold or is substantially similar or functionally equivalent to one that is sold in substantial quantities to the general public, intrinsic value is the established catalog or market price, plus the value of any unique requirements, including delivery terms, inspection, packaging, or labeling.

(2) If there is no comparable item sold in substantial quantities to the general public, intrinsic value is defined as the price an individual would expect to pay for the item based upon an economic purchase quantity as defined in FAR 52.207-4, plus the value of any unique requirements, including delivery terms, inspection, packaging or labeling.

(c) At any time up to two years after delivery of a spare part or item of support equipment, the Contracting Officer may notify the Contractor that based on all information available at the time of the notice, the price of the part or item apparently exceeds its intrinsic value.

(d) If notified in accordance with paragraph (c) above, the Contractor agrees to enter into good faith negotiations with the Government to determine if, and in what amount, the Government is entitled to a refund.

(e) If agreement pursuant to paragraph (d) above cannot be reached, and the Navy's return of the new or unused item to the Contractor is practical, the Navy, subject to the Contractor's agreement, may elect to return the item to the Contractor. Upon return of the item to its original point of Government acceptance, the Contractor shall refund in full the price paid. If no agreement pursuant to paragraph (d) above is reached, and return of the item by the Navy is impractical, the Contracting Officer may, with the approval of the Head of the Contracting Activity, issue a Contracting Officer's final decision on the matter, subject to Contractor appeal as provided in the "DISPUTES" clause (FAR 52.233-1).

(f) The Contractor will make refunds, as required under this requirement, in accordance with instructions from the Contracting Officer.

(g) The Contractor shall not be liable for a refund if the Contractor advised the Contracting Officer in a timely manner that the price it would propose for a spare part or item of support equipment exceeded its intrinsic value, and with such advice, specified the estimated proposed price, the estimated intrinsic value and known alternative sources or item, if any, that can meet the requirement.

(h) This requirement does not apply to any spare parts or items of support equipment whose price is determined through adequate price competition. This requirement also does not apply to any spare part or item of support equipment with a unit price in excess of $100,000; or in excess of $25,000 if the Contractor submitted, and certified the currency, accuracy and completeness of, cost or pricing data applicable to the item.

STATEMENT OF WORK

HELICOPTER TURBINE ENGINE TEST CELL
CAPACITY UPGRADE
SECTION C: PRODUCT PERFORMANCE REQUIREMENTS

C1.0 INTRODUCTION

The objective of this project is to provide a complete instrumentation and control system for Engine Test Cell 11 at Corpus Christi Army Depot. Prior to the accomplishment of this task, Test Cell # 11 will have

undergone a complete refurbishment under a separate contract, consisting of all existing equipment and support systems removal and the installation of the new support systems (i.e. power distribution and control systems; cooling water systems: oil piping systems; etc.). The upgraded cell will provide state of the art fully automated testing of all existing and projected workload of turbine engines. In addition, the contractor shall develop a comprehensive engine test, scheduling, acceptance and archive system to which all engine test cells can be integrated.

REQUIREMENT	SCOPE
Basic	Includes all work associated with the test cell and the test acceptance system
Option 1	Extended warranty – annual, for up to 3 years beyond the initial 2 year period
Option 2	Remote diagnostics - annual, for up to 3 years beyond the initial 2 year period

C1.1 Statement of Objectives.

The contractor shall provide all labor, materials and technical support to design, install, and certify a "turn-key" engine test cell at Corpus Christi Army Depot. Contractor shall certify Engine Test Cell for T700 and T55 families of engines. The contractor shall provide capability to test future derivatives of T700, & T55 of engines and to include T800 based on available technical data at time of contract award

C1.1.1. Project Management Plan (PMP). The contractor shall develop a PMP which details the approach to managing the project from design to certification to include technical, cost, and schedule performance. Special attention shall be given to reducing negative impact on CCAD engine production.

C1.1.2. Data Acquisition and Control. The contractor shall provide a state-of-the-industry control and data acquisition system for control of both test auxiliary systems (Ref: C1.1.3) and the engine under test. This will be an integrated system solution with equipment for data acquisition and control. The contractor shall select the best control and data acquisition system based on life cycle cost, reliability, availability, supportability, maintainability, sustainment, and performance characteristics. CCAD's objective is a state of the art ergonomic system that controls engine speed and torque with a minimum deviation from the set point. System shall provide high-speed data acquisition (minimum 2500 channels per second scanned, converted to engineering units and limits checked) and include provisions for data logging and capture with commercial off-the-shelf (COTS) software capability to plot and trend data as well as save stored plots and tests in digital data format. Vibration monitoring shall include programmable tracking filters and ability to generate, save, trend and plot high definition spectrum (Fast Fourier Transform) plots and peak lists. Systems shall maximize the use of digital smart transducers (for digital scaling and configuration). System shall include user programmable warning and shutdown indicators and limits and use these limits to interlock various starts and/or run conditions of the test cell. System shall provide full stand-alone testing, reporting and archiving in the cell as well as with the test initiation, evaluation and archive system also included as part of this statement of work. If proven systems are available, selected system shall include both full automatic and manual control. In their technical proposal the Offeror shall also detail the proposed method of testing test data integrity and validity before the data is accepted as a test point, e.g., size of data sample stream, averaging of test data within a certain number of standard deviations, data checking via Chauvenet's criteria. For safety, system shall include large mushroom-head emergency shut-down buttons located both in the control room and out in the cell; their actuation shall provide an accelerated but orderly shutdown of the engine fuel, oil, electrical, air and water brake supply. This system shall be automatically engaged whenever the automatic fire suppression system is activated. The system must be fully programmable and maintainable by CCAD employees. The system shall feature open-system architecture using commercial off the shelf components and no "Black Box" technology. All computer programs, test program sets, firmware, software and hardware shall become property of the government with unlimited rights upon acceptance of the test cell.

C1.1.3. Engine Load System. The contractor shall use a Kahn 108-080-013 hydraulic dynamometer in conjunction with gear reduction to accommodate all engine speed and torque requirements. Fixtures and equipment for calibration of the load system, or adapters for using existing equipment, shall be provided by the contractor.

C1.1.4. Remote Maintenance Monitoring and Reporting. The contractor shall provide, via a secure site at contractor's facility, remote maintenance monitoring of the system. The remote monitoring shall allow the contractor to monitor the health of the system and allow for scheduled preventive maintenance instead of untimely breakdown maintenance. The contractor shall provide regular reports detailing the health of the system. The awarded contract shall provide annual option periods for the continuation of remote

monitoring services. Visibility of the system shall also be available on the engineering office workstation as well as that of the CCAD configuration manager.

C1.1.5. Test Initiation/Evaluation/Archive System. The system shall interface with all the engine test cells, and will facilitate the following scenario: Based on Depot Maintenance Work Requirement (DMWR) criteria a test record shall be constructed, listing the test elements/operational checks to be performed. At the beginning of each test the approved TEST PROGRAM SETS (TPS) software, located in a central "repository" would shall be compared against the copy resident in the test cell to verify that the latest approved version software is used for the test. If the official repository version has been updated, the updated version shall be downloaded to the cell automatically. Once the test is begun, test data will be saved in the cell as well as in the central evaluation system server until the complete test is passed. The central evaluation system server shall automatically be backed up several times per hour. When the complete test is evaluated and passed, a test report shall be generated in the central evaluation system server and passed to a corporate information server/data warehouse and archived. The existing CCAD data warehouse uses Oracle 8i & 9i. All engine and module product identity elements along with the results of tests data streams sent to the data warehouse shall be in a format that is easily imported to Oracle. Communications from test cell to CCAD database of record shall occur using ANSI 802.3, 10/100BaseT EtherNet running full TCP/IP protocol stack.

However, A copy would be retained in its native format so that the test record can be reopened and appended to in case the need for penalty runs arises. As a minimum, the output data stream shall be American Standard Code for Information Interchange (ASCII) format. Contractor shall provide data element dictionary with complete documented data element attribution. In addition to test results, data stream shall include engine serial number, Production control number, production sequence number, part/model number and CAGE code. The identity fields will be associated to and in addition to the results of test fields.

The system shall be designed such that tests can be completed and evaluated even if communications is interrupted outside the test cell. Once communications are restored, the system shall look for, process and archive any test data waiting in the queue. This system shall also be fully owned and maintainable by CCAD. The system shall be capable of being piggybacked onto the existing system to allow input of existing test records while porting the old system to the new. The existing Test Program Sets refers to the necessary hardware, software and firmware required to test and evaluate an asset’s performance in accordance with the test requirement. Acceptance software shall be a separate entity from the data acquisition software to allow for easy upgrades to either. The central evaluation system output data stream/file shall act as the point of demarcation for the contractor. The import of data at the data warehouse and operation of the data warehouse will be the responsibility of the government.

A replacement integrated software system, which can be used with existing acquisition data acquisition systems in CCAD’s other engine test cells, is preferred. The new system shall interface with existing GE and Honeywell performance rating programs.

C2.0 SCOPE

The contractor shall have turnkey responsibility for all phases of the job. These phases shall include but not be limited to the following:

Scheduling & Planning

Design Reviews

Design

Test Cell Controls and Instrumentation

Software

Integration With/Impact On Existing Test Cells

Procurement of Components

Preliminary Component Testing

Delivery and Storage

Installation

Connections

Ring-Out

Programming

Correlation Testing

Depot Maintenance Work Requirement (DMWR) Testing

Repair Parts

System Stability/Reliability Testing
Training
Maintenance Support
Remote Diagnostics
On-site Support
Documentation
Submittals
Manuals
Drawings
Software
Standard Warranty
Extended Warranty

C3.0 REQUIREMENT

C3.1 General. The over-all requirement is to provide CCAD with an engine test cell and support system that can be used to accurately and efficiently test helicopter turbine engines and engine modules in accordance with the test section of the latest version of the Depot Maintenance Work Requirement requirements listed below

ENGINE	Research Development and Engineering Command (RDECOM) Requirement
T800	TBD
General Electric T700-GE-401	Engine DMWR 1-2840-248
General Electric T700-GE-401C	Engine DMWR 1-2840-248
General Electric T700-GE-700	Engine DMWR 1-2840-248
General Electric T700-GE-701	Engine DMWR 1-2840-248
General Electric T700-GE-701C	Engine DMWR 1-2840-248
General Electric T700-GE-701D	TBD
Honeywell T55-L-712	Engine DMWR 55-2840-254
Honeywell T55-GA714A	Engine DMWR 55-2840-265
All	AED P3417

The contractor is responsible for all aspects of the project from start to finish. Finish is defined as meeting all contract acceptance criteria and Government signing Form DD250.

C3.1.1 STANDARDS. Offerors shall note that all standards referenced within the appendices are also applicable as noted therein. Appendix A provides applicable References and Abbreviations.

C3.1.1.1 Engineering Drawing Practices. ASME Y14.1, Y14.24M, Y14.34M Y14.35M and Y14.100M apply to the drawings/ designs produced for this project. In addition, instrument piping and wiring drawings will conform to ISA-5.3-1983 and ISA-5.4-1991.

C3.1.1.2 Electrical. Electrical system design, installation and inspection will be according to NFPA 70, National Electric Code 2005. Note that test cell is classified as a Class 1, Div. 2. in regards to explosion hazards.

C3.2 Scheduling and Planning.

All work shall be completed within 12 months of contract award. The contractor shall plan all aspects of the project and maintain the scheduled milestones on Microsoft Project software.

C3.2.1 Meetings and Reviews.

C3.2.1.1 Presubmittal Post-Award Conference. The Contractor shall arrange and conduct a Start-of Post-Award Conference with the Government within fifteen (15) days after contract award. This meeting shall take place at the Government's facility. The purpose of the Conference shall be to informally review the manner in which the Contractor intends to respond to the Contract requirements prior to the preparation of submittals. The Contractor shall keep formal minutes of all questions, events and resolutions, which transpire. The contractor is not authorized to make any changes to the contract unless authorized by the Contracting Officer. The contractor will be provided an opportunity to combine onsite data gathering while participating at CCAD in the Post-Award Conference. Prior to the adjournment of the conference, all parties must concur with the accuracy of the minutes and sign-off accordingly.

C3.2.1.2 Preliminary Design Review (PDR). Within 90 days of award, contractor shall hold a preliminary design review at CCAD. Purpose of review is to secure government acceptance of basic design and long lead time items. The review is to present basic layout of new system with proposed major pieces of equipment identified, and to ensure seamless integration of the equipment with existing facilities. Prior to the PDR, no major pieces of equipment shall be purchased. Barring complications, Notice to Proceed shall be granted at conclusion of PDR.

C3.2.1.3 Critical Design Review (CDR). When the design is approximately 90% complete, contractor shall hold a CDR to discuss final design effort and any CCAD preference changes, staying within the scope of work of the contract. CDR shall be held at CCAD.

C3.2.2 Schedules. The project schedule shall be generated and tracked on project management software such as Microsoft Project. The contractor will create the schedule and present it to CCAD for acceptance; the agreed to schedule will become the project baseline schedule.

C3.2.2.1 Schedule Baseline. The performance period for this project shall not exceed twelve (12) months from signing of the contract award. The contractor will produce an overall project schedule within 30 days of project start, with CCAD providing comments on it within two weeks. The schedule must be in sufficient detail to identify deviations as small as one working week. An agreed-to schedule will be produced within 60 days of project start. Project progress will be tracked, recorded and reported weekly by the contractor against the baseline.

C3.2.2.2 Schedule Adjustments. Schedule progress reporting will be such that deviations from schedule of more than a week will be evident. Weekly progress reports will specifically address schedule deviations and their likely impact on the overall project schedule. Schedule deviations of more than two calendar weeks will result in a recovery plan by the contractor. At the instigation of either project manager, but not more often than monthly, the baseline schedule may be adjusted by incorporating agreed-to recovery plans and other changes. The revised baseline schedule then becomes the baseline for future project reporting.

C3.3 Design

The contractor is responsible for all designs within the project unless otherwise indicated. Contractor may develop their own design or may pattern their design after the existing test cells, insomuch as the existing cell design meets the current requirements. All systems necessary for the operation of the engine test cell will be installed new. Contractor shall not select designs or equipment that would preclude CCAD from providing total in-house support.

C3.3.1 Impact On/Integration With Existing Test Cells. The contractor shall design the test system such that installation will facilitate project completion and installation with the least impact on production. This impact minimization is especially relevant to any modification being accomplished by the contractor of the existing monorail system and resources/systems currently shared between/among cells.

C3.3.1.1. Electrical Wiring Routing and Support. All instrument signal cables shall be shielded individually. The new electrical cables and wires will be grouped logically and routed together in orthogonal directions between their sources and destinations to the maximum extent possible. No electrical cables or wires will be routed under pipes transporting flammable liquids. Cable trays will support electrical cables and conduits will support wiring to the maximum extent possible. All cables carrying direct current (DC) signals shall be kept isolated from cables carrying alternating current (AC) signals. Running cables carrying DC signals in conduits or cable trays with cables carrying AC signals shall not be permitted.

C3.3.2 Test Cell Controls and Instrumentation. Test cell controls and instrumentation shall be replaced in their entirety. System design shall permit testing of engines in accordance with Paragraph C3.1 of the Statement of Work. Connections of controls to engines shall be ergonomically designed to provide easy access to on-engine adjustments and facilitate routine parts changes. Controls and adjusters shall be designed to reduce to a minimum the need for an operator to enter the test cell while an engine is running. Where practical, transducers located in the test cell shall be located out of the path of possible engine component projectiles or shall be located together in an explosion-proof enclosure. The new system shall be remotely viewable by the contractor, the Equipment Engineering office and the Configuration Manager (CM). The new system shall provide security from unauthorized configuration changes and shall notify both the Equipment Engineering office and the CM when changes are attempted, both remotely and locally.

C3.3.3 Data Acquisition and Control System. Contractor shall provide a complete data acquisition and control system that is capable of controlling, monitoring, processing and recording engine parameters necessary to meet the applicable test requirements, including transient or "jam test" data. The system provided shall be a proven system, successfully used for testing jet turbine engines. The system shall permit unlimited government modifications. The Data Acquisition and Control system (DAC) shall be designed for ultra-high reliability and maintainability. and provide system operability/availability a minimum of 99.5% of the time. The DAC system includes all components, e.g. wiring, piping and transducers necessary to measure the required parameters. These shall take advantage of the interfaces provided on the engine adapters to the maximum extent practical. At a minimum, system shall provide features as described in paragraph C1.1.2. System shall be provided in a configuration to permit 200% growth in the number of parameters monitored. CCAD LAN communications requirements are included in APPENDIX D. Specific requirements of the C&I system are included in APPENDIX B.

A parallel computer system shall be installed to collect data on channels identified for troubleshooting the cell systems. This will include flows, pressures, temperatures, and vibration data on the facility systems. Water brake speed and load information will also be included with data collected by serial number. Open-source software for trend analysis shall be included. This computer will be used as the network connection.

C3.3.3.2 Engine Load System. The contractor shall supply a KAHN 108-08-013 series water brake with gearing necessary to accommodate testing of both T55 and T700/800 engines. Contractor shall provide and install instrument systems necessary for its operation. The engine load system installed shall be compatible with continuing to use the existing monorail, engine adapter and thrust frame for installing the engine.

C3.3.4 Automated Functions.

C3.3.4.1 Single Operator Operation. Data acquisition functions will be automated so that a single operator can perform engine testing from the workstation.

C3.3.4.2 Automatic Shutdowns and Alarming. System shall provide user-configurable shutdown and alarm functions. Alarms shall be configured to protect the engine and operators in the event of out-of-control conditions. Specific alarm conditions and setpoints will be defined and agreed upon by CCAD and the contractor. There must be adequate alternate means of safely continuing or shutting down the testing in the event of the loss of any automated function. These shall include a means of automatically reducing engine control to the Ground Idle condition as well as a means for automatic fuel shutoff. Trigger mechanisms and shut down conditions shall be determined by collaboration of contractor and CCAD. Mushroom-head E-Stop pushbuttons located on the console and front and rear of the test cell shall initiate a rapid controlled shutdown of the engine.

C3.3.4.3 Closed Loop Control. A proven system is to be supplied in which the control system design shall permit closed loop automated control of engine as well as manual A proven system is defined as one in which the components have been used in conjunction with one another in some previously successful installation. The CCAD is not interested in obtaining a prototype control system.. Closed loop control consists of the test system automatically controlling engine operating conditions to predefined setpoints and soak times as determined by the test requirement, with no intermediate input required by the operator.

C3.3.5 Engine Controls and Indicators. Contractor shall provide all controls and indicators necessary for operating and monitoring the engines while running. A fail-proof emergency engine shutdown system shall be provided. Control of the load system will provide for stable steady-state readings at data points specified in the DMWR.

C3.3.5.1 Fuel Controls and Indicators. An electronic throttle actuator shall be provided at the test control workstation to operate the engine fuel control and set the power level. The throttle will mimic the operation of the aircraft throttle.

In addition to test cell fuel shutoff valves, an emergency fuel shut-off provision shall be provided as close to the engine as practical, and controllable from the test control room. This will be separate from the engine throttle.

Fuel pressure and fuel flow indicators shall be provided at the test control workstations as appropriate to the engines being tested.

C3.3.5.2 Engine Load Control and Indicator. Electronic controls for the engine load system shall be provided at the test control workstation so that the load being applied to the engine can be controlled. A torque indicator will be provided to monitor engine load. The torque indicator source will be separate from the engine torque system, but indications from the normal engine torque indicating source must be displayable for cross-check. This control must provide for stable load application during steady-state test points, -0 to +50 inch pounds of torque, and provide for instant switching to manual for operator control when necessary.

C3.3.5.3 Engine Revolutions Per Minute (RPM) Indication. As necessary for the engines being tested, engine gas generator and power turbine real-time RPM indications shall be provided. These RPM indications will be available at the test control workstations. The sources for these indications will be separate from the engine transducers, but indications from the normal engine transducers must be displayable for crosscheck.

C3.3.5.4 Engine Start Control and Indication. Engine start controls appropriate for the engines being tested shall be provided at the test control workstations. Start system status indicators will be provided. Engine start is to be under automatic control within acceptable parameters as identified in the DMWR.

C3.3.5.5 Fire Suppression System Control and Indication. Manual and automatic controls for activating the fire suppression system shall be provided in the test control room. System shall tie into existing Naval Air Station (NAS) Corpus Christi fire alarm system. Contractor shall provide all coordination with Navy Fire Department for tie-ins and testing. Fire suppression system status indicators will be provided at the test control workstations.

C3.3.6 Vibration System. Contractor shall provide a state of the art?? (jet engine testing) industry vibration monitoring system. The system shall monitor each section of the engine and load system with separate transducers. System shall have programmable tracking and band pass filters capable of monitoring engine vibrations as required by the technical data. In addition, the system shall provide for displaying, logging, plotting, trending and storing real-time Fast Fourier Transform (FFT) plots and peak lists. These plots and peak lists will be used for troubleshooting high vibration engine and load system components as well for documenting engine performance. This information will be monitored and stored in the troubleshooting computer system.

C3.3.7 Test Acceptance System. The contractor shall provide test acceptance software that measures engine and engine module performance against established DMWR rating criteria. Design and implementation shall be consistent with the objectives stated in paragraph C1.1.2.

C3.4 Procurement

It shall be the contractor’s responsibility to purchase any and all items required for completion of the project, unless stated as government furnished material or property (GRM/GFP) in the statement of work or it’s appendix.

C3.5 Storage and Handling

All equipment and materials delivered to the jobsite shall be stored in a location that will not interfere with the operations of other Contractors or the Government. Storage and handling will be performed in manners that will afford maximum protection to the equipment and materials. It is the Contractor's responsibility to assure proper handling and on-site storage. Off-site storage shall be acceptable providing hardware is available at the job site with a 24-hour advance notification.

C3.6 Installation

C3.6.1 The Contractor shall design, install and be responsible for furnishing all labor, parts, material and equipment unless GFM/GFP for successfully accomplishing a complete “turn-key” installation of the new equipment at Corpus Christi Army Depot. Installation process shall be coordinated with a CCAD point of contact to minimize interference with normal depot operations.

C3.6.2 All wiring shall be according to the latest version of National Electric Code (National Fire Protection Association (NFPA) 70). All wires/cables carrying alternating current (AC) shall be run in separate conduits from wires/cables carrying direct current (DC) or other signal wires. This separation of signals shall extend throughout the entire electrical circuit, including as much as possible, inside the control consoles.

C3.6.3 All wiring shall be color coded and identified alphanumerically, with the identification appearing at all connections (e.g. at all terminal strips, transducer and device/console connections). All identification shall be permanently applied to the wires and cables, and shall be secured by clear heat shrink tubing. The identification used shall be annotated on the drawings required under this contract.

C3.6.4 The Government will provide the existing 460 VAC 3 phase and 120 VAC single-phase electrical sources.

C3.6.5 Console shall have central ground and neutral busses to which all AC-powered sensors and console equipment shall be connected.

C3.6.6 All tubing runs shall be made using a single piece of tubing from end-to-end as much as possible. Where tube-to-tube connections are required, the number of connections per tubing run shall be minimized in order to reduce sources of leaks.

C3.7 Calibration

C3.7.1 Contractor shall provide calibration procedures, checklists, and charts in a separate 3-ring binder and in digital format for use by government calibration personnel. Format shall be consistent with that for existing test cells. For all pressure transducers, contractor shall provide 3-way valves with a quick disconnect on one port for connection to the calibration standard. On control panel, contractor shall provide a means of performing a static "shunt calibration” to verify electronic integrity of strain gage channels. Use of engine adapter interface plate for connection to a total system calibration module is a preferred alternative.

C3.7.2 After installation and subsystems testing, contractor shall calibrate test cell with Government calibration personnel using National Institute of Standars and Technology (NIST) traceable calibration standards. This calibration may serve as the required training of calibration personnel. Each data parameter shall be checked at zero, 25, 50, 75 and 100 percent of channel range. Channel calibration shall be within the tolerances for existing CCAD test cells as well as all data referenced in section C3.1 of the statement of work. If a data channel will not calibrate properly, the defective component shall be replaced and recalibrated.

C3.7.3 After calibration, contractor shall supply a certificate of calibration, documenting that the system was calibrated with National Institute of Standards and Technology (NIST) standards. Expiration date of calibration shall not exceed one year.

C3.8 Testing

C3.8.1 General. Testing shall be performed at multiple stages of completion. Contractor shall include all testing on the project schedule. General test requirements are included here; for components referenced in appendices, test requirements are included in those appendices. If a discrepancy exists between testing requirements, the contractor shall bring it to the attention of the government for quick resolution.

C3.8.2 Pre-delivery Testing. The contractor will test all software and hardware components, to the maximum extent practical, prior to shipment to CCAD. Component testing shall be designed to ensure functionality of components, and software testing shall be designed to ensure basic function of software, at least at the software module level. Basic purpose of pre-delivery testing is to reduce risk by screening for problem areas at the manufacturer’s or contractor’s facility, where problem resolution is less costly than on-site debugging and resolution. The government may desire to accomplish a product status review visit at contractor's facility during various design/build/test phases of the Control Console and associated software.

C3.8.3 Subsystems Testing. After installation, all wiring shall be checked for continuity and possible shorts between wires and from wires to conduits. All support systems, e.g. cooling, lube, fuel shall be tested prior to performing a test run.

C3.8.4 System Testing. Contractor shall perform preliminary system testing and resolve all discrepancies prior to notifying the government that the cell is ready for acceptance testing. System testing shall include successfully running all tests for all engines and modules listed in Paragraph 3.1 of the statement of work.

C3.8.5 Acceptance Testing. After successfully completing system testing, contractor shall notify the government that the test cell is ready for acceptance testing. All acceptance testing shall take place at CCAD. All acceptance testing shall be performed in the presence of government witnesses. System will be accepted by the government upon successful completion of the following:

DMWR tests indicated in Paragraph 3.1 of the statement of work.

Correlation of cell with GE and Honeywell cells in accordance with current version of AMCOM AED-P3417 as outlined below.

Certification testing per CCAD Quality Engineering requirements.

C3.8.5.1 Correlation to OEM Cells. Engine test cells are required to be correlated to the engine manufacturer's test cells. The requirements for correlation are outlined in AMCOM AED-P3417. This will be supplied by CCAD as GFI in hard copy format. The government maintains run data for correlation engines run in the OEM's test cells. The contractor will run the same correlation engines in the test cell and shall be responsible for any test cell related changes required to bring the test runs into compliance with the required performance tolerances. Contractor shall provide copies of all software to the CCAD CM prior to correlation and upon final acceptance. Any correlation engine changes, repairs or modifications are the government's responsibility.

C3.8.5.2 DMWR Testing. After successful correlation, the contractor shall demonstrate successful engine runs in accordance with the DMWRs listed in Paragraph 3.1 of the statement of work. The government will provide the required engines as GFE. Each DMWR test shall be run a minimum of 3 times. Test cell shall not fail during tests; failure of any contractor-supplied component will invalidate the test. Contractor shall repair or replace defective component, recalibrate any affected instrumentation parameters and repeat the test.

C3.9 Training

C3.9.1 General: Training shall be provided to cover all aspects of the system along the following guidelines.

C3.9.2 Control System Training. The Contractor shall provide training for the purpose of familiarizing Government's personnel with the control system. The following training shall be included. All tuition costs related to training courses shall be included in the contractor's cost proposal As used herein, the term "week" means a five (5) day, forty (40) hour week. None of the courses detailed here will overlap. Courses shall be scheduled in series so as to allow the same personnel to attend more than one training course. The training shall be scheduled a minimum of sixty (60) days in advance of when they are to be given. Proposed training materials, including a detailed training agenda itemizing relative emphasis on various topics of each course, shall be submitted to the Government at least one hundred twenty (120) days in advance of when the course is to begin. The Government shall review this outline and provide comments that shall be incorporated into the course.

C3.9.3 Preparatory training (at Contractor's Facility): A series of preparatory training courses shall be conducted at the Contractor's facility prior to commencement of any factory testing. One (1) one-day control system familiarization course for project management personnel, engineers and key operating/maintenance personnel shall be provided for two (2) persons each. The course content shall include, but not be limited to a description of: control philosophy; All major hardware components utilized in the system; data logging/trending software functions; system operating modes and procedures; and, Hardware and software maintenance practices.

C3.9.4 Operational Training (at Contractor's Facility): Two (2) one-week control system configuration and operating courses shall be provided for four (4) persons each. The level of training shall be sufficient to familiarize the Government's personnel with all control loops associated with the control center, with the generation and application of control/data acquisition programs, and with all essential system operating procedures associated with the control room work station.

C3.9.5 Configuration Training (at Contractor's Facility): One (1) three-week computer system configuration and operating courses shall be provided for two (2) people each who typically have prior programming experience. The level of programmer training shall be sufficient to:

Familiarize the Government's personnel with enough details of the system programs to enable them to use and modify the programs.

Enable the Government's personnel to compose and generate all required CRT-based process graphics and report/log formats. All work performed by the Government's personnel shall be done at the contractor's facility. The contractor shall develop all graphics required for this project.

Enable Government personnel to write, edit, file, delete, and apply high-level process control language programs, as necessary to implement all control system and process information functions. The use of assembly language programming shall not be necessary to implement or maintain control system and/or process information system activities.

Familiarize Government personnel in the function and use of support and application software.

C3.9.6 Operator/Maintenance Training: Training course shall be conducted at CCAD prior to the startup of processes associated with the control system equipment. One (1) Operating Training Course for the computer system to provide instruction in control equipment operation, both individually and collectively as an operating system, shall be conducted by the contractor. All procedures required to operate and modify each process from the control room console shall be described. Normal, as well as abnormal, startup and shutdown operating conditions shall be covered, including the response to failure occurrences and system alarms. All operator/control system interactions shall be described and demonstrated in conjunction with the use of all process information system functions. Class shall be for a minimum of one week to train up to four (4) persons. The contractor shall coordinate training sessions with operations personnel thirty (30) days prior to conducting any classes.

C3.9.7 Automatic Testing Sequence: The contractor shall supply training for two people at either CCAD and/or the contractor's site to train CCAD engineers on the automatic testing of the specified engines. The specified engines shall be provided as GFE. Any training required to modify any phase of automatic computer control shall be included in this section.

C3.9.8 Test Evaluation and Archive System. The contractor shall supply training for four people at either CCAD or the contractor's facility to train CCAD employees on the use and maintenance of the system. Target audience shall include test cell inspectors who would build engine test records as well as those responsible for modifying and maintaining the system.

C3.9.9 Calibration Training. The contractor shall supply training for four people at CCAD after installation and check-out of the system. This training may be in combination with the contractor's requirement to calibrate the test cell.

C3.10 Documentation

The contractor shall supply all documentation required by the contract. All documentation referenced in the appendices shall be required just as if the requirement were listed in this section.

C3.10.1 Submittals. Contractor shall provide submittals on all major components, i.e., pumps, motors, valves, controls and instrumentation

C3.10.2 Drawings. Within 30 days of Government acceptance of the test cell, the contractor shall provide one complete set of installation and as-built drawings, to include complete bills of material and control system and interface diagrams. Drawings shall include but not be limited to console assembly drawings, electrical ladder drawings, control loop drawings, PLC I/O device list/address list/ladder logic listing, PLC and control system configuration drawings and instrument tag list. Drawings shall be provided in both hard copy, 24 x 36 inch (C-Size) and floppy disk or CD media as AutoCAD ".dwg" files (Release 14, 2000, 2002, 2004). Electrical drawings shall reflect the complete circuits, including wiring all the way to controlled/monitored switches and/or transducers, and shall identify all intermediate connections. Power wiring drawings shall identify source back to the applicable existing building feeder.

C3.10.3. Volume three shall contain vendor information on all purchased assemblies. For major console components, PLCs, computers, controllers, power supplies, pumps, motors, variable speed drive, vendor information shall include complete operation, maintenance, troubleshooting and repair procedures.

C3.10.4 Manuals. Within 30 days of Government acceptance of the test cell, the contractor shall provide three complete copies of the operation and maintenance manuals. Manuals shall be delivered both in hard copy and in floppy disk/CD format. Electronic copy shall be in either ASCII or Microsoft Word 97 or higher.

C3.10.4.1 Operation and Maintenance Manuals. Manuals shall be segregated into volumes. Volume one shall act as the operator's manual for training and operating purposes, and shall be organized as shown below.

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Section I	Introduction
Section II	Description
Section III	Theory of Operation
Section IV	Installation of Unit(s) Under Test (UUT)
Section V	Operating Instructions
Section VI	Removal of Unit(s) Under Test UUT
Section VII	Operator Troubleshooting

C3.10.4.2 Volume two shall contain calibration and maintenance information, test cell bill of materials (BOM). BOM of material shall list all items used together with the original manufacturer's name and part number. Maintenance information shall include all information required to support and/or repair the components therein.

C3.10.4.3 Volume three shall contain control system operation and maintenance instructions. Specific step-by-step instructions for replacing and reconfiguring the control/communications computer shall be included.

C3.10.5 Software. Within 30 days of Government acceptance of the test cell, the contractor shall provide hard copies of all source code, firmware and software used in the system as well as one set of backup software for all programmable components within the system. Computer backup shall be organized such that if a new computer is installed, running a "setup" disk/CD performs all steps automatically or prompts the user to change disks/CDs if more than one is required. If any special programming software or programming software interface devices (such as hardware "keys" or "PIC" modules) are required to access software or ladder logic, these programs and devices shall be included as well, two (2) sets for each component. One set goes to the CCAD Equipment Engineering office and one set goes to the CCAD configuration manager (CM). If custom application software was written and provided, a copy of any required compilers (with license) shall be provided as well. At acceptance, all these items shall become property of the government. Any software purchased for this project shall be registered to Commander, Corpus Christi Army Depot, Corpus Christi, Texas 78419.

C3.11 Quality Assurance

The Contractor shall have an instituted quality assurance program which emphasizes organized methodologies and standards, including American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) and International Organization for Standardization (ISO) standards.

C3.12 Warranty

The complete system and each item of instrumentation and control equipment (and associated software) included therein shall be guaranteed to meet or exceed the design requirements set forth in the specification and on the drawings.

Equipment, software, and materials which do not achieve design requirements after installation shall be replaced or modified by the Contractor to attain compliance, at no additional cost to the government. Following replacement or modification, the Contractor shall re-test the component or loop and perform any additional procedures needed to place the complete system in satisfactory operation and attain approval from the government.

C3.12.1 Standard Warranty. Following final Government acceptance of the test cell, the contractor shall provide two-year repair and preventative maintenance. All equipment, software, labor and materials shall be included in the coverage. During the maintenance period, contractor shall maintain accurate detailed records of expenditures. A copy of these records shall be provided to the government as they are accrued. At end of maintenance period this data may be used to renegotiate the price on the next option year.

C3.12.2 Option for Extended Warranty. Pricing for optional warranty and preventive maintenance extensions for an additional 3 years in 1-year increments shall be provided in the proposal as an option. The scope of the extended warranty shall be the same as for the standard warranty.

C3.12.3 Spare Parts. Contractor shall provide a one-year supply of all consumables required to operate the test cell for a one-year period.

C3.12.4 Spare Parts Options. Pricing for an additional 3 years in 1-year increments shall be provided in the proposal as an option for the contractor to provide one-year supply of all consumables required to operate the test cell for a one-year period.

C3.13 Remote Diagnostics.

Contractor shall provide remote diagnostics as described in the control system requirements for an initial 2-year period after Government acceptance of the test cell.

C3.13.1 Option for Extended Remote Diagnostics. Pricing for optional extensions for an additional 3 years in 1-year increments shall be provided in the proposal as an option. The scope of the extended diagnostics service shall be the same as for the initial 2-year period.

APPENDIX A: REFERENCES

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National Fire Protection Association. NFPA 241: Standard for Safeguarding Construction, Alteration, and Demolition Operations. : NFPA, 2000.

National Fire Protection Association. NFPA 423: Standard for Construction and Protection of Aircraft Engine Test Facilities. : NFPA, 1999.

National Fire Protection Association. NFPA 70: National Electrical Code. : NFPA, 1999.

AMCOM: Army Material Command

ASAP: As soon as possible

BTU; British Thermal Unit: A measurement of heat energy.

calibration: Establishing the relationship between a measurement of a parameter and the actual value of the parameter.

CCAD: Corpus Christy Army Depot

CDR: Critical Design Review

CDRL: Contract Document Requirement List

CM: Coordination Memo

CO: Change Order

CO2: Carbon dioxide

DMWR: Depot Maintenance Work Requirement; The Army Material Command's instructions for overhauling a component.

DoD: Department of Defense

down time: The time that a piece of equipment or system is inoperative due to a failure or malfunction.

dynamometer: A device for applying a known torsional load to a rotating machine for the purpose of testing the machine's output.

EO: Engineering Order epoxy: A solid material which results from the polymerization of two resins when mixed together.

FY: Fiscal Year; October 1 through September 30.

GEDRP: General Electric Data Reduction Program helicopter turbine engine: All helicopter turbine engines are turboshaft engines (see below).

ID: Inside diameter min.:

Minute orthogonal: Mutually perpendicular

PDR: Preliminary Design Review

PPM: Pounds Per Minute

PSI: Pounds per square inch

relative humidity: The amount of water vapor in the air as a percentage of the maximum possible water vapor in the air at that temperature.

RPM: Revolutions per minute; a measure of rotational speed

RRR: Run Readiness Review

safety factor: The amount by which the parameter exceeds the requirement, expressed as a percentage, or the ratio of the parameter to the requirement.

sec.: Second

TMDE: Test Measurement & Diagnostic Equipment detachment; the organization responsible for calibrating test cell instrumentation.

torque: A measure of rotational force.

transducers: A mechanism for transforming a force to an electrical signal that can be interpreted as being proportional to the force.

turboshaft engine: A gas turbine engine which delivers power through a rotating drive shaft. In helicopters, the drive shaft powers the rotors through a gearbox.

Varsol: A brand of industrial solvent

water brake: A type of Dynamometer that produces load from the resistance of water to the rotation of its components.

APPENDIX B: CELL CONTROL & INSTRUMENTATION

Requirements

The specific requirements for the C&I system are provided in the following sections.

C&I System Definition and Description

The primary component of the C&I system is the data acquisition function of the test cell, which acquires important engine performance parameters in real-time while the engine is running. Average of 5 points of the data are then analyzed by the engine manufacturers' Data Reduction Programs (DRPs) as required. The C&I system also provides test cell operators with the ability to control the testing according to step-by-step acceptance test procedures provided by the engine manufacturers. Control hardware includes throttle and governor levers, load torque control, switches/contact closures, potentiometer adjustments, and control computer keyboard interface.

C&I System Block Diagram

A block diagram of the C&I system within the engine test cell is depicted in Figure 3-1. The C&I System does not include the engine water brake load, certain test cell facilities and fixtures, or the computers which host the DRPs. The C&I system must contain a multi-channel, real-time data acquisition system, and must be able to display this information on computer monitors for two operators ("pilot" and "co-pilot"). The data acquisition system must include signal conditioning as required for a variety of transducers and sensors in the test cell. The data acquisition system, operator controls, operator displays, signal conditioning, and the control computer are to be located in the control room of the test cell. Some transducers and sensors are provided as part of the engine under test, and some are Government Furnished Equipment (GFE), but most must be included in the C&I system acquisition. Some sensor and control components must be purchased from the OEMs (G.E. and Honeywell) of the engines to be tested. All wiring and cabling from the control room to the sensors, transducers and control hardware are also part of the C&I system.

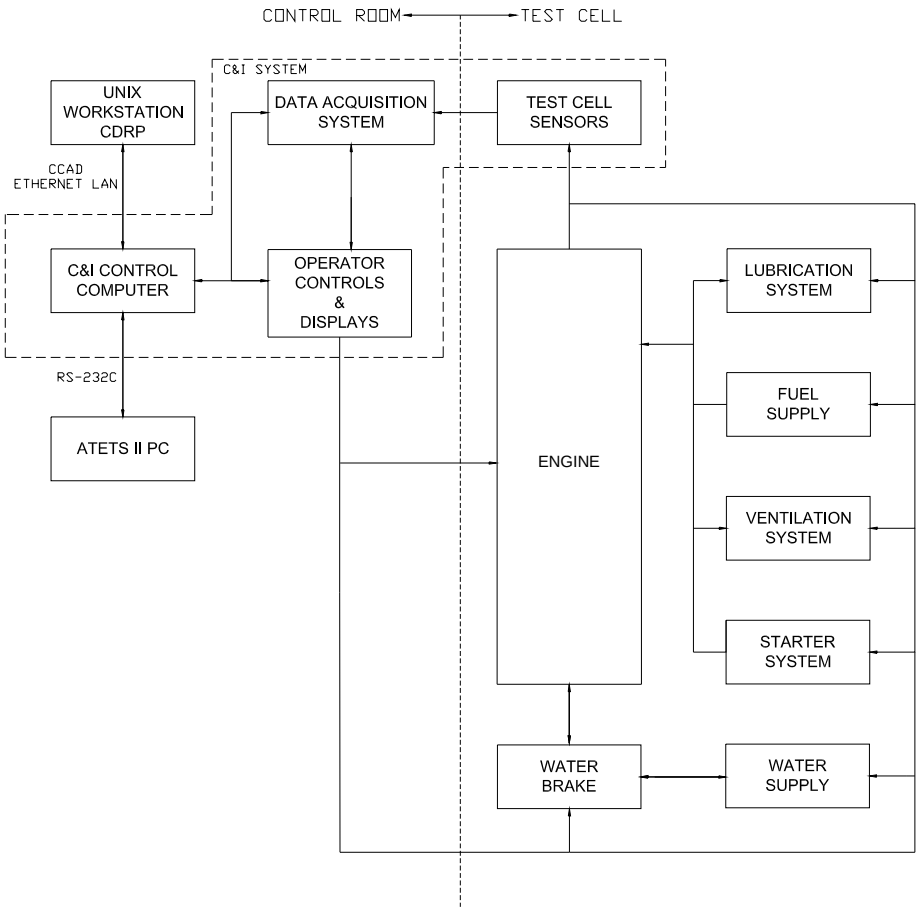


Figure 3-1. Test Cell C&I System Block Diagram

System Hardware Components

The Test Cell C&I hardware is comprised of four major components.

- **Data Acquisition System.** Used to measure data from sensors and convert to digital values in real time. Includes signal conditioning.
- **Control Computer(s).** Used for processing the input signal conditioned data, providing the operator interfaces, and exchanging data between the Data Reduction Programs (which can be hosted either on the Control computer or remote Unix Workstation), and the ATETS II application that resides on a DOS-based PC.
- **Transducers/Sensors.** Used for monitoring engine performance parameters, test cell Instrumentation, and Water Brake instrumentation.
- **Operator Controls.** The following types of controls are included in the C&I system.
  - Levers (Example: for controlling Engine Speed and Water Brake Torque)
  - Control Knobs (Example: for Controlling Np Demand)
  - Panel Buttons and Switches (Example: for testing the Over-speed Engine Function)
  - Vendor Specific Controls (Example: Honeywell Console Kit)

C&I Real-Time Data Acquisition

This subsystem provides the link between the Operator Console computer and the instrumentation sensors. The Data Acquisition system shall be housed in the Test Cell Control room and controlled via a local computer (PC or Unix

based) located in the same room. During testing, a number of channels will be scanned in real time. Typical scan rates are 10 samples per second for each channel. Some channels may have higher scan rate requirements. Section 3.2 provides a detailed listing of the required data acquisition channels and independent requirements for those channels.

The data acquisition system shall be a compact, modular Commercial-Off-The-Shelf (COTS) system from a leading manufacturer, capable of being expanded and upgraded. Industry standard modules and communications interfaces shall be utilized. The system must have the necessary throughput speed to scan, acquire, filter, and display data in real time from all channels simultaneously at the specified rates. Signal conditioning must be included to provide calibrated data acquisition for thermocouples, Resistance Temperature Detectors (RTDs), engine torque meters, and other sensors as necessary. The data acquisition system must be capable of averaging any input signal over a specified time and displaying this average, thus providing digital filtering of the signals when desired.

C&I Control Computer

The C&I control computer must be able to communicate to the Unix based Workstations located either in the Operator control room, or at a remote location via an Ethernet LAN, which hosts the Data Reduction Programs (DRPs). The Control Computer must also be capable of passing data to the ATETS II computer via RS-232 in response to pneumonic tags sent by ATETS II. Both pilot and co-pilot displays are required, each with the ability to independently display data from pre-determined channels of the data acquisition system. The operator shall have the capability to add or subtract “display data points” of all available channels as required. The display shall be capable of displaying 100 parameters with no degrading of the system. The required screen update rate for all displayed parameters is a minimum of five times per second (5 Hz). The system must also be capable of visually indicating alarm conditions and highlighting out-of-bounds measurements in real-time to provide immediate notification of such conditions to the test cell operators. Where safety conditions are monitored, an audible alarm must also be included, which can be implemented on the controller or with an external device.

C&I Transducers and Sensors

The C&I transducers and sensors include thermocouples, RTDs, pressure transducers, flow meters, counters or timers, torque meters, vibration transducers, encoders, voltage dividers, engine chip detectors and contact measurement. The requirements for the transducers vary, but each must provide the measurement accuracy specified by the parameter tables provided in Appendix C. In some cases, transducers are integral to the engine or to the facility. In other cases, the transducers or sensors and associated signal conditioning must be purchased from the Engine OEM by the contractor All thermocouples used to measure engine parameters will be provided by CCAD as GFE.

C&I Controls

Engine speed and Water Brake Torque are normally controlled by the test cell operator. It shall be possible to control these parameters manually, using levers located in the Operator Control Room. In addition, the ability to override and control these parameters automatically via the control software is required. The primary objective of this feature is automatic and rapid chop of the throttle when certain established maximum limits have been exceeded. A secondary objective is the automation of start and test sequences.

The following Controls are required for this system.

1. Water Brake Control Lever(s) to control the Torque applied to the Engine Shaft. NOTE: The Water Brake is not included in the C&I system. However, controlling mechanisms may be included, depending on the Water Brake type.
2. Power Available Spindle (PAS) and Load Demand Spindle (LDS) Levers for Controlling the GE T700.

N1 (Compressor Rotational Speed) and N2 (Power turbine rotational speed) throttle levers for controlling the Honeywell T55L712 engine.

3. ECL throttle lever and N2 set knob for the Honeywell T55GA714A engine.
4. Control Knob for controlling the GE T700 Np Demand.
5. Panel Buttons and Switches for testing other Engine and Test Cell Functions.
6. Vendor Specific Controls. Testing the Honeywell Engines requires a unique Vendor Specific Console which communicates to the Engine Control Unit and provides the Np Demand.

Software Functional Requirements

A set of overall software functional requirements is given in the following paragraphs. These requirements are envisioned to be provided by a combination of operating system, user applications, test executives, and graphical user interfaces or some subset thereof. It is incumbent on the designer to create a logical and functional partition of these software elements to provide the desired functionality in such a manner that inter-program operation is transparent from the system operator's point-of-view. The intent is to provide a description of the minimal software functionality that is needed. Additional software capability is desired for increased flexibility and maintainability of the system. The preferred method for implementing the software is using a fully functional COTS software package that is easily reconfigurable by CCAD organic support (such as LabView/TestStand or InTouch/Wonderware). Any software code uniquely developed for this application shall be fully documented and shall be delivered with the latest source code and an appropriate development/compilation environment.

The C&I System Software must provide the ability to scan all data acquisition channels, or a selected subset, continuously in real-time at the specified data rates. The software must allow display of different measured parameter subsets on two or more screens simultaneously, for the "pilot" and "copilot" operators. Any subset of the data acquisition channels shall be selectable for display. The parameters shall be displayable in a number of different formats, including numeric, bar graphs, sliders, strip charts and gauges. The display type, location, size, color, scaling, and digital resolution for each parameter must be easily selectable. Software filters, limits and alarms must be selectable for each channel. Calculated values based on formulas, tables and/or multiple data channels must be allowed for calculation and display in real-time, while maintaining all data acquisition sample rates and screen update rates. This includes linearization and/or characterization of sensors when required. The software must be capable of automatically determining when redundant sensors fall outside of a pre-selected correlation tolerance, and providing an alarm indication in such instances. It must also be capable of ignoring a sensor when two or more sensors measuring the same parameter are in significant disagreement.

The software must have the capability of alerting operators when parameters fall outside predetermined limits, usually with color coding or highlighting. Also, when certain chosen parameters fall outside of predetermined limits, the software must be capable of indicating an alarm condition. This can be accomplished with panel mounted alarm annunciators or virtual alarms (on the monitor screen). An audio alarm must also be included for safety conditions. The software must also be capable of evaluating alarm conditions and taking corrective actions, such as retarding the throttle to idle or cutting fuel to the engine. These safety requirements are described in more detail in section 3.3.3.

The software must include calibration and self test modes of operation, and must have modes that are specifically geared toward each type of engine to be tested. The software must also be capable of interfacing with the DRPs via Ethernet and the ATETS II program via RS-232.

Specific Component Requirements

Vendor Specific Components

The following vendor specific components are required for the C&I system. Alternates to these systems will be considered when the alternate provides the minimum technical requirements as well as enhanced capabilities. In particular, the Vibration System, T55GA714A Operator Console, T55GA714A Flight Line Test Set, and Oil Temperature Controller are of particular interest for alternates.

1. Endevco TFASII Vibration System
    a) Accelerometers: Model 6222S-20 for Engine mounts (2 ea)
        Model 6222S-50 for AGB (1 ea)
        Model CEL-4-128 Water Brake and H2O pump (2 ea)
    b) Charge Converter: Model 2777A-02-25, Gain 2, HP Freq 25Hz. (5 ea)
    c) TFAS II Amplifier System: Model 68222 8-channel Amplifier.
2. FlowDyne IPS Venturi Flow Meter: P/N VP052920-SUF.
3. Honeywell T55GA714A Test Console Package P/N: LTCT30520 Includes:
    Honeywell T55GA714A Operator Console w/ Engine controls and lever.
    Honeywell T55GA714A FADEC (to be mounted in Test Cell near Engine).
    Honeywell T55GA714A Engine Dress Kit P/N LTCT 31100
    Honeywell T55GA714 Torque Meter
4. Honeywell T55L712 Engine Dress Kit P/N: TBD
5. Honeywell Oil Temperature Controller (T55GA714 Engines) P/N LTCT 31486
6. T55GA714A Flight Line Test Set
7. Pile National Connectors (special for G.E.) for the E1 and E3 ECU connectors
(See section 3.2.4)

GFE Components

The following Government Furnished Equipment (GFE) is included in the C&I system.

CCAD T55L712 Internal Engine Torque Meter Signal Conditioner (T55GA712 Engines)

All Engine Temperature and Oil Sensors

GE T700 PAS, LDS, and Stage1 Vane Angle encoder engine mounting H/W.

Honeywell T55L712 N1 and N2 encoder engine mounting H/W.

C&I Parameter Requirements Table

The C&I parameter requirements table is provided in an Excel spreadsheet included as part of the bid solicitation package. This requirements table gives the detailed requirements for each parameter to be measured by the C&I system, including parameter location, performance range, accuracy, engine applicability, sensor/transducer type, and sample rate. Tags are provided for reference to the C&I system diagram.

C&I System Diagram

The C&I System Diagram is provided in Appendix C. The system diagram includes four separate diagrams of the test cell C&I system as follows:

1. Master diagram showing all C&I required parameters.

2. GE T700 diagram showing C&I parameters required for GE T700 engines only.

3. Honeywell T55L712 diagram showing C&I parameters required for T55L712 only.

4. Honeywell T55GA714A diagram showing C&I parameters required for T55GA714A only.

A parameter tag reference table is provided to define all tags and give a cross-reference to the C&I Parameter Requirements Table.

C&I System Characteristics

Measurement Capabilities

The C&I System must, at a minimum, be capable of measuring the following parameters using Commercial Off the Shelf (COTs) instrumentation and data acquisition equipment:

Engine

- Accessory Gear Box: Pressure, Vibration, and Chip Detection
- Air Inlet: Temperature & Pressure (PS1, PS1, and T0)
- Anti-Ice: Temperature & Pressure
- Customer Bleed: Flow, Temperature, & Pressure
- Compressor Discharge: Temperature & Pressure (PS3, T3)
- Engine RPM: (N1, N2, Ng, Np, Ngg, Npp)
- Engine Torque
- Engine Static Indicators
- Engine Control Levers (PAS, LDS)
- Engine NP/N2 Demand Control Pot
- Engine Fuel: Flow (Wf), Specific Gravity, Pressure and Temperature
- IPS: Airflow (Pressure & Temperature)
- Engine Oil Discharge: Pressure & Temperature (EODT, EODP)
- Engine Oil Scavenge: Temperatures and Pressures
- Power Turbine Inlet: Temp (T4.5, PTT)
- Engine Exhaust: Temperature and Pressure (PS9)
- Engine Vibration

Facilities

- H2O: Flow, Pressure, & Temperature.
- Oil Temperature Controller
- Air Start Pressure and Control

Water Brake

- Water flow rate, temperatures and pressures
- Oil pressure & temperature
- Torque
- Bearing H_2O and oil flow rates, and pressures.

Test Cell

- Barometric Pressure
- Absolute Humidity
- Engine Power supply voltage and current indicators
- Lighting Contactor control
- Ignition Voltage and Current Indicators

Temperature Measurement

A large number of temperature measurement channels are required for the C&I system, most of them employing thermocouples or RTDs as the sensor. Some important points to consider in developing the required temperature measurement techniques include sensor range and accuracy, dynamic response, noise immunity, resistive losses, cold junction compensation, non-linear characterization, and ruggedized packaging. These characteristics shall be carefully analyzed and optimized for the particular parameter being measured. In some cases, thermocouples will

have to be characterized and calibrated in order to achieve the required accuracy. A brief description of the signals to be measured and their required sensors follows:

Air Inlet Temperatures (T0) (GE T700 Engines) Range: -40°F to 150°F, Accuracy ±0.5°F. Eight RTD sensors are to be evenly spaced around the circle formed by the Bellmouth screen. Air Inlet temperature is a critical parameter for proper characterization of the engine and correlation testing of the test cell, requiring a great deal of accuracy and long term stability. Careful consideration of error sources such as self-heating and wire resistance must be taken into account to achieve the required accuracy. Response time, defined as time to reach 63% of final temperature when a step change occurs, shall be less than 2 seconds. The typical use of the eight air inlet sensors is to eliminate outliers and average the remaining sensor readings. The data acquisition system must be able to perform calculations in real time with a minimum sample rate of 10 samples per second. These sensors shall be furnished by CCAD as GFE.

Air Inlet Temperature (T0) (Honeywell T55 Engines) Range: -40°F to 150°F, Accuracy ±0.5°F. Four RTDs are to be evenly spaced around the circle formed by the Bellmouth screen. A portion of the RTDs allocated for the GE Engine can be used. The RTDs may need characterization before the accuracy specification can be achieved. Response time, defined as time to reach 63% of final temperature when a step change occurs, shall be less than 2 seconds. These sensors shall be furnished by CCAD as GFE

Compressor Discharge Temperature (T3) (GE T700 Engines)- Range: 0°F to 1200°F, Accuracy +/-5.4°F. Two custom, dual element Type E thermocouples are used for making this measurement. These sensors shall be furnished by CCAD as GFE.

Compressor Discharge Temperature (T3) (Honeywell T55 Engines)-Range: 0°F to 600°F, Accuracy ±5.4°F. Three RTDs shall be furnished by CCAD as GFE.

Power Turbine Inlet Temperature (T4.5) (All Engines): 0°F to 2000°F, Accuracy ±5.4°F <1472°F , ±7.2°F >1472°F. A Type K thermocouple is employed in the engine to measure this critical parameter. One data acquisition channel shall be allocated for this sensor.

Engine Exhaust Temperature Rake (T9) (All Engines): 0°F to 2000°F, Accuracy ±5.4°F <1472°F , ±7.2°F >1472°F. A thermocouple harness employing six Type K thermocouples, mounted in the engine exhaust flow, is required, providing a single averaged output to the data acquisition system. These sensors are used for diagnostics when troubleshooting the engine.

Particle Separator Temperature (GE T700 Engines)- Range: -40°F to 150°F, Accuracy ±0.5°F required. Two RTDs are required for the IPS temperature measurement, and are to be mounted at the inlet of the FlowDyne IPS Venturi Flow meter, a required vendor-specific transducer. Two sensors are used for redundancy and accuracy.

Oil Temperatures (GE T700 Engines)- Range: 0°F to 400°F, Accuracy ±0.5°F required Two Type E thermocouples are required to measure the B-Sump Forward oil scavenge temperature and the engine oil discharge temperature (EODT). In addition, 6 Type E Thermocouples and data acquisition channels are recommended for monitoring the other oil scavenge points on the engine during engine diagnostics and troubleshooting.

Oil Temperatures (Honeywell T55 Engines)- Range: 0°F to 600°F, Accuracy ±1.8°F below 392°F, ±5.4°F above 392°F. Two Type E thermocouples are required to measure oil scavenge temperatures at the #2 and turbine bearings.

Engine Oil Temperature Bulb (Main Oil Pump Discharge Temp.) (Honeywell T55 Engines)- Range: 0°F to 300°F, Accuracy: ±1.8°F. A special nickel RTD is resident in the engine for measuring oil temperature.

Engine Oil Out Temperature (Honeywell T55GA714A Engine): Range: 30°F to 510°F, Accuracy ±2°F. A type E thermocouple is required for monitoring the engine oil out temperature, to be located in the facilities oil return line. This sensor is used to identify a safety alarm condition.

Oil Temperature Controller Temperatures (Honeywell T55GA714A Engine)- Range: 30°F to 510°F, Accuracy ±3°F. 3 RTDs appropriate for measuring oil temperature shall be employed for oil cooler inlet, outlet and an oil calibration loop on the LTCT 31486 oil temperature controller required

Fuel Temperature (All Engines): Range: -100°F to 200°F, Accuracy ±0.5°F required. Two Type E thermocouples are required for measuring the fuel temperature near each of the two fuel flow meters in the facility.

Engine Anti-ice Temperature (GE T700 Engines): Range: 30°F to 510°F, Accuracy ±2°F required. A Type E or Type K thermocouple is required for making this measurement. The sensor is to be mounted at the applicable port on the Engine Bellmouth. This sensor is used for engine troubleshooting.

Customer Bleed Air Temperature (GE T700 Engines): Range: 500°F to 800°F, Accuracy ±5.4°F required. A Type E thermocouple is required for mounting on the customer bleed engine compressor port. This sensor is used for engine troubleshooting.

Water Brake Strain Gauge Temperature (All Engines): Range: 30°F to 950°F, Accuracy ±5°F required. A Type E thermocouple is required to monitor the water brake strain gauge temperature. A thermocouple sensor is recommended due to the location of the sensor and its possible exposure to water.

Water Brake Water Temperatures (All Engines): Range: 30°F to 210°F, Accuracy ±3°F required. Two Type E thermocouples are required to measure water in and out temperatures. Thermocouple sensors are recommended due to the location of the sensors and their possible exposure to water.

Water Brake Oil Scavenge Temperatures (All Engines): Range: 0°F to 600°F, Accuracy ±3.0°F required. Three Type E thermocouples are dedicated to rear and forward bearing oil scavenge temperature measurements on the water brake. Thermocouple sensors are required due to the location of the sensors and their possible exposure to water.

Cooling Tower Basin Water Temperature (All Engines): Range: 30°F to 210°F, Accuracy ±3°F required. A Type E thermocouple is recommended to monitor the cooling tower basin water temperature for safety and diagnostic information. A thermocouple sensor is recommended due to the location of the sensor and its possible exposure to water.

Hydraulic Start System Temperature (All Engines): Range: 30°F to 510°F, Accuracy ±3°F required. An RTD shall be provided to monitor the Hydraulic Start System temperature for safety and diagnostic purposes.

Spare Thermocouple Channels: Sixteen channels of spare thermocouple data acquisition, signal conditioning, and harness routing shall be supplied capable of accepting type K or type E thermocouples.

Spare RTD Channels: Sixteen channels of spare RTD data acquisition, signal conditioning, and harness routing shall be supplied, capable of accepting RTD sensors.

Pressure Measurements

Pressure measurements for measuring air, oil, water, and fuel are required as part of this acquisition specification. When possible, the sensors are to be located in an enclosure in the test cell, and connected to the engine's "pressure ports" via pneumatic tubing and "quick-disconnect" fittings. The use of digital pressure transmitters is required when accurate measurements are required, provided that acquisition speed requirements can be met. In addition to providing scaled data back to the C&I system, using digital pressure transmitters reduces the overall number of data acquisition channels required by the C&I system. The following paragraphs detail the pressure transducers and measurements required for supporting the C&I system. The transducers are divided into four categories; Air, Fuel, Oil, and Water.

Air Pressure Sensors

Air Inlet Pressure (PS0) (All Engines): Range: 0-10" H_2O, Accuracy ±0.1% FS value (GE Specification). The T700 DMWR specifies using 4 static baskets, each with 4 sensor inputs for measuring the Bellmouth Static Pressure. The Honeywell T55 Engine Specification only requires the use of 1 static basket. These pressure ports are located at the front end of the bellmouth and are used for determining the inlet air pressure. This reading in conjunction with the Bellmouth Throat Static Pressure is used in calculating the Engine Mass Air Flow (an important parameter in determining the engine efficiency).

Bellmouth Throat Static Pressure (PS1) (All Engines): Range: 0-5 psig, Accuracy ±0.1% FS value (GE Specification). The T700 DMWR specifies the use of 8 sensors spaced every 45 degrees around the bellmouth. The Honeywell DMWR specifies the requirement for 4 sensors for the T55L712 engine and 3 sensors for the T55GA714A engine.

Compressor Discharge Pressure (PS3) (All Engines): Range: 0-300 psig, Accuracy ±0.1% FS value (GE Specification). A pressure port is located on the compressor for measuring the air pressure as it leaves this stage of the engine. Since this transducer is used across all three engines with varying ranges, it is required that a pressure transmitter with a programmable range setting be used. A transducer with a 0-300 psig range will accommodate all three engine types.

P3 Boroscope Pressure (PS3-X). (GE Engines)

Combustor Inlet Total Pressure (T55L712 Engines)

Compressor Discharge Pressure #2 (PS3) (T55GA714A Engines): Range: 0-300psig, Accuracy ±0.1% FS value (GE Specification). This is a secondary port that is used for measuring the air pressure as it leaves the compressor stage of the engine. Since this transducer is used across all three engines with varying ranges, it is required that a pressure transmitter with a programmable range setting be used. An XDCR with a 0-300psig range will accommodate all three engine types.

Exhaust Static Pressure (PS9) (GE Engines): Range: 0-10" H_2O, Accuracy ±0.1% FS value (GE Specification). The T700 DMWR calls out the use of 2 transducers for calculating this value. The two pressure ports are located on the Engine Turbine.

IPS "Particle Separator" (GE Engines): 0-10" H_2O at inlet, and 0-60" H_2O at throat, Accuracy ±0.1% FS value (GE Specification). The GE Engines divert a portion of the inlet airflow to the particle separator to filter out impurities in the air entering the engine. It is important however to calculate this airflow so that it can be subtracted from the total inlet airflow and provide the true airflow entering the engine. To calculate the flow, two pressure measurements are recorded, along with a temperature reading taken at the venturi inlet. The pressure measurements are taken at the venturi flow meter inlet and throat. The delta pressure is then used in conjunction with the

temperature and flow chart to calculate the mass airflow. The T700 DMWR specifies using thee redundant ports at the inlet and two at the throat for calculating the pressure readings.

Customer Bleed Pressure (GE Engines): Range: 150-250psig, Accuracy ±2%. This port is located on the engine compressor and provides auxiliary air pressure to the cabin. This parameter is useful for troubleshooting engine problems.

Water Brake Air Supply Pressure (All Engines): Range: 0-300 psig, Accuracy ±2%. This sensor monitors the air pressure going to the water brake.

Air Start Pressure (All Engines): Range: 0-50 psig, Accuracy +/-2%. This transducer monitors the air pressure going to the Engine Air Starter.

Barometric Pressure (All Engines): Range: 27-33" Hg, Accuracy ±0.006 "Hg. This sensor is mounted in the Test Cell and is used in calculating the Engine Mass Airflow.

Fuel Pressure Sensors

Fuel Inlet Pressure (All Engines): Range: 0-100 psig, Accuracy ±2%. This pressure port is located at the Engine fuel inlet.

Secondary Fuel Inlet Pressure (T55L712 Engines): Range: 0 to -30" Hg, Accuracy ±2%. Secondary port on T55L712 Engines used for monitoring engine fuel pressure. This port produces a negative pressure.

Fuel Boost Pressure (GE Engines): Range: 0-200 psig, Accuracy ±2%. This pressure port is located on the Accessory Gear Box.

Fuel Control Pump Pressure (T55 Engines): Range: 0-1000 psig, Accuracy ±2%. This sensor port is located on the engine manifold downstream from the fuel pump.

Facilities Fuel Filter Pressure – Upstream (All Engines): Range: 0-100 psig, Accuracy ±2%. This sensor port is located on the Test Cell Fuel piping upstream from the fuel flow meters and facilities fuel filter.

Oil Pressure Sensors

Engine Oil Discharge Pressure (EODP) (All Engines): Range: 0-200 psig, Accuracy ±2%.

Gear Box Pressure (T55 Engines): Range: -30 - +60 psig for T55L712 Engines, 0-10psig for T55GA714A Engines, Accuracy ±2%. This sensor is located on the Engine Gearbox.

Rear Bearing Oil Inlet Pressure (T55 Engines): Range: 0-100 psig, Accuracy ±2%.

Power Turbine Bearing Oil Scavenge Negative Pressure (T55L712 Engines)

Bearing 4&5 Oil Scavenge Negative Pressure (T55GA714A Engines): Range: 0 to -15 psig, Accuracy ±2%. Note this is a negative pressure.

B-Sump Scavenge Pressure (GE Engines): Range: 0-10 psig, Accuracy ±2%. This port is part of the Engine Lube System. This is not a critical parameter, but is useful for troubleshooting engine problems.

Water Brake Lube Oil Supply pressure (All Engines): 0-50 psig, Accuracy ±2%. This transducer is located downstream from the facilities water brake bearing lube oil supply and is used in conjunction with a flow meter to monitor the status of the oil flow and pressure entering the water brake.

Facility Lube Oil Level Pressure (All Engines): Range: 0-60" H_2O, Accuracy ±2%. This transducer is used for monitoring the facilities oil reservoir level.

Facility Lube Oil Pressure (All Engines): Range: -25 - +25" Hg. Accuracy ±0.5"Hg. This transducer is used for monitoring the oil pressure in the facilities lines running to the engine.

Water Pressure Sensors

Water Brake Pump Pressure (All Engines): Range: 0-200 psig, Accuracy ±2%. This sensor is located on the Water Brake pump outlet. It measures the water pressure leaving the pump supplying water to the water brake.

Water Brake Bearing Pressure (All Engines): Range: 0-300 psig, Accuracy, ±2%. This sensor is used in conjunction with a turbine flow meter to monitor the water pressure going to the Water Brake bearings.

Water Brake "In" Water Pressure (All Engines): Range: -30 -150 psig, Accuracy ±2%. This sensor is located on the water brake. It measures the water pressure entering the water brake.

Water Brake "Out" Water Pressure (All Engines): Range: 0-160 psig, Accuracy ±2%. This sensor is located on the water brake. It measures the water pressure leaving the water brake.

Cold Water Level Pressure (All Engines): Range: 0-60" H_2O, Accuracy ±2%. This sensor is used for monitoring the cold water level in the facility.

Flow Measurements

The C&I system depends on various flow measurements for Engine efficiency testing as well as for monitoring test cell safety conditions. Turbine and/or paddlewheel meters are required depending on accuracy requirements. The following paragraphs provide the range and accuracy details for the flow meters used in the C&I system.

Fuel Mass Flow Measurment (Wf) (All Engines): Accuracy ±0.5%. One in-line turbine flow meter is required for this measurement as per the T700 DMWR. A second redundant coriolis flow meter is also required. The coriolis measurement technique eliminates the need for specific gravity measurement, and shall have higher accuracy. The coriolis meter must maintain the required accuracy at the sample rate of 10 Hz (response time must be <= 0.1 mS). The suggested model is the Foxboro model CFT50. The flow rate obtained from the turbine flow meter is used in conjunction with the fuel specific gravity measurements, which must be made with a hydrometer (0.002 resolution), to calculate the fuel mass flow going to the engine. The meters are located in the Test Cell Fuel piping and shall be sized to support a flow range from 25 lb/hr to 2500 lb/hr (turndown ratio of 100:1). The C&I system must be capable of obtaining a linearized result for fuel mass flow at the specified data acquisition rate of 10 samples per second.

IPS "Particle Separator" Mass Flow (GE Engines): For measuring the mass airflow through the particle separator, a Flowdyne Venturi Flow Meter, P/N VP052920-SUF is required. In addition to providing the flow meter, the vendor shall also be responsible for providing the IPS exhaust line from the engine to the flow meter.

Customer Bleed Raw Flow (GE Engines): Accuracy ±2%. The flow meter is connected to a port on the engine compressor and shall be sized to support a flow of 5-50lb/hr.

Facility Water Brake Water Flow Rate: Accuracy ±2%. This flow is monitored to insure that sufficient water is flowing into the water brake from the facilities cooling basin. The meter is located in the Test Cell Water Brake facilities piping and should be sized to support a flow range from 0 to 120gpm. Approximate facilities pipe diameter is 3".

Water Brake Bearing H_2O Flow Rate: Accuracy ±2%. This flow is monitored to insure that sufficient water is flowing into the water brake bearing from the facilities cooling basin. The meter is located in the Water Brake plumbing and shall be sized to support a flow range from 15 to 20 gpm. Facilities pipe diameter is ½".

Water Brake Bearing Oil Flow Rate: Suggested transducer output range: 0-2000 Hz, Accuracy ±2%. This flow is monitored to insure that sufficient oil is flowing into the water brake bearing from the facilities water brake lube oil supply. The meter is located in the water brake Oil lube piping. Facilities pipe diameter is ¼".

Water Brake Air Flow Rate: Suggested transducer output range: 0-2000 Hz, Accuracy ±2%. This flow is monitored to insure that sufficient air is flowing into the water brake from the facilities CDA supply. The meter is located in the Water Brake pneumatic tubing. Approximate facilities pipe diameter is ½".

Engine Lube Oil Flow Rate: Suggested transducer output range: 0-2000 Hz, Accuracy ±2%. This flow is monitored to insure that sufficient oil is flowing into the Engine Lube System from the facilities lube oil supply. The meter is located in the facilities oil lube plumbing. Facilities pipe diameter is ½".

RPM Measurements

RPM measurement is critical for engine test, and several important aspects must be considered. A periodic signal is provided whose frequency is proportional to the rotor RPM. The different engines have different transducer frequencies at 100% rotational speed, as shown in table 3-1:

Engine	Parameter	Percent Speed	Rotational Speed	Transducer Freq.
T700	Ng	100%	44700 RPM	2135.7 Hz
T700	Np	100%	20900 RPM	1393.3 Hz
T55L712	N1	100%	18720 RPM	70 Hz
T55L712	N2	100%	15334 RPM	70 Hz
T55GA714A	NGG	100%	18720 RPM	2787 Hz
T55GA714A	NPT	100%	15334 RPM	2816 Hz

Table 3-1 – Engine Rotational Speeds and Transducer Frequencies at 100% Speed

In order to sample the rotational speed parameters at a required 10 samples per second rate, a period measurement of one-half, one, or a small number of cycles is required. The period shall then be converted to frequency and the calculated values of RPM and % speed shall be reported. The basic accuracy for the measurements is ±0.2%. A COTS counter/timer data acquisition component may be employed.

An important consideration for the RPM measurements is software filtering/averaging. The data acquisition system must be capable of performing averaging/filtering, and reporting the result as the RPM in real time. RPM "jitter" is a common problem in testing engines, especially when utilizing a Water Brake load. Excessive jitter can make snap shots of engine performance inaccurate. However, filtering that excessively reduces fluctuation and change will not be acceptable to Quality Assurance. Flexibility in filtering and/or averaging techniques is therefore required.

The data acquisition system can utilize two channels for RPM measurement which support the requirements for all three engine types, or it may use up to six channels, one for each engine specific rpm measurement, if needed to meet the different frequency requirements. In addition, two spare channels are required for future expansion.

Torque Measurement

Engine torque is measured internally in the engine, as well as on the water brake load. For the GE T700 engines and the Honeywell T55GA714A, an output voltage of 0-8VDC must be measured to an accuracy of ±0.05% for internal engine torque. This correlates to approximately 0-9600in-lbs for the GE T700 engines and 0-24,000 in-lbs for the Honeywell T55-GA-714A engines. For the GE engines an external torque stabilizer is required to reduce torque oscillations. This stabilizer is a CCAD GFE item.

For the T55L712 engine internal torque, a special power supply/signal conditioner circuit is required, and will be supplied by CCAD. The resulting output is a 0 to 80 millivolt DC nonlinear signal, as graphed in DMWR 55-2840-254 Figure 7-4. The output of the signal conditioning circuit must be properly calibrated and characterized, as described in the DMWR. A data acquisition channel shall also be provided to measure the power supply voltage for the T55L712 strain gauge signal conditioning circuit, which has a range of 0 to 500 millivolts AC. This measurement is for diagnostic purposes.

The exact method for measuring water brake torque is to be determined. One or more channels must be dedicated to load torque measurement as required, with the range of torque values being 0 to 2000 lb-ft and the required accuracy being ±1.5 lb-ft.

Encoder Measurement

The C&I system includes several encoders for testing the GE T700 (3 encoders), Honeywell T55L712 (2 encoders), and Honeywell T55GA714A (1 encoder) engines.

GE T700 Encoders. Range: 0-360°, with a minimum of 900 pulses/revolution, Incremental Encoder. The GE engine requires three encoders for monitoring the position of the Power Available Spindle (PAS) (0° to 130°), Load Demand Spindle (LDS) (0° to 130°), and the Stage 1 Vane Angle position (-10° to 40°). These encoders are mounted on custom manufactured brackets that attach to the engine. It is required that the encoders be identical to those presently used at CCAD, or a form-fit-functional replacement. The encoders used in existing CCAD test cells are DRC (now GSI Lumonics) Incremental Encoders.

Honeywell T55L712 Encoders. Range: 0-360°, with a minimum 900 pulses/revolution, Incremental Encoder. The C&I system requires one encoder mounted to the existing CCAD interface bracket for monitoring the Power Lever Position (0-160deg). A second encoder for monitoring the N2 throttle position is preferred for diagnostic testing.

Honeywell T55GA714A Encoders. Range: 0-360°, with a minimum 900 pulses/revolution, Incremental Encoder. The C&I system requires one encoder mounted to a CCAD interface bracket for monitoring the Engine Control Lever Position (0-90deg).

In addition to the encoders, the C&I system requires a data acquisition card capable of monitoring both 2X and 4X quadrature counting. Separate channels shall be allocated for each encoder input for the three engine types.

Vibration Measurement

The required method for acquiring vibration measurements as part of the C&U system is to procure the same measurement hardware used in the existing test cells. An alternate system may be proposed and considered which meets the requirements and offers enhancements to those existing. The current hardware used is an Endevco TFAS II Vibration system, which is comprised of the following hardware:

a) Accelerometers: Model 6222S-20 for Engine mounts (2 ea)
Model 6222S-50 for Accessory Gear Box (AGB) (1ea)
Model CEL-4-128 Water Brake and Facilities Water Pump (2 ea)

b) Charge Converter: Model 2777-02-25; Gain: 2, HP Freq: 25Hz. (1 per Accelerometer).

c) TFAS II Amplifier System: Model 68222 8-Channel Computer-Controlled Digital Tracking Filter Amplifier.

The accelerometers are to mount directly to the Engine Accessory Gear Box (AGB) and Turbine. The outputs of the accelerometers are connected to the 2777 Charge Converters, which are mounted to the engine hoist. For testing GE engines, the acceleration output of the converter is used, whereas on the Honeywell engines, the velocity output of the converter is used. The output of the charge converters are routed to the operator control room to the TFAS II Amplifier System.

The TFAS II Amplifier System is contained in a 19" rack mountable chassis and is computer controlled via IEEE-488. There are 3 analog outputs for each input channel (Amplitude, Frequency, and Phase). These analog outputs are then fed into the C&I system for determining pass/fail criteria**.**

An alternate vibration monitoring system, which incorporates the technical requirements as stated, will be considered for adoption. The system must be able to include water brake system vibration and provide for comparison of all inputs in real time.

Chip Detectors

Three chip detectors must be monitored by the data acquisition system (gearbox, power turbine oil scavenge and No. 2 bearing oil scavenge). The magnetic field of a chip detector is designed to capture debris particles which can bridge a gap between two electrodes. This bridging acts as a switch closure for an alarm circuit or "chip" light.

A typical circuit employing a chip detector is shown below.

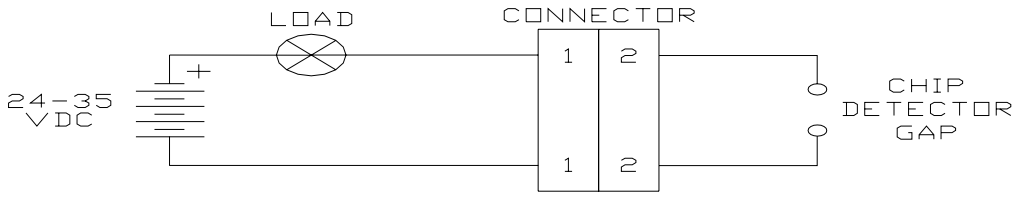


Figure 3.2-1. Typical Chip Detector Circuit

The load is normally a cockpit indicator lamp with a typical resistance of 500 to 1500 ohms. The signal conditioning for monitoring the chip detectors shall include 28 Vdc excitation and a 28 volt panel mount light on the test cell operator console, or an equivalent load and an alarm indicator light. Chip detector voltage or current shall be monitored by the data acquisition system. In addition to the three required chip detector channels, one spare chip detector channel shall be provided to include the required power and signal conditioning circuit.

Engine Static Indicators.

The C&I System requires the ability to monitor static dc signals coming from the Engine. These are typically 0-15vdc signals coming from the engine ECU. The "ON/OFF" status of these signals needs to be visually available to the test cell operators. The following is a list of signals in this category.

Oil Filter Bypass Indicator (GE Engines): 0-15 vdc.
Fuel Filter Bypass Indicator (GE Engines): 0-15 vdc
Anti-Icing Bleed and Start Valve Indicator (GE Engines): 0-15 vdc
Torque Match Input Indicator (GE Engines): 0-15 vdc.

Absolute Humidity

Absolute humidity in the test cell must be measured. Range: 0 to 200 grains/lb, Accuracy ±2%. This can be accomplished by using a dew cell hygrometer with an RTD temperature output, a humidity/dewpoint transmitter with an RS-232 or other communications interface, or a chilled mirror hygrometer. The mixing ratio is the calculated parameter that is required, with units of "grains per pound".

Voltage and Current Measurement

The following ranges of voltage and current measurement are needed.

400Hz Power Supply Voltage (All Engines): 0-30 vdc
400Hz Power Supply Current (All Engines): 0-50 mA
Ignition voltage indicator (All Engines): 0-125 V
Ignition current indicator (All Engines): 0-3 A

The Honeywell T55L712 Engine requires the use of a special signal conditioning module that includes a GFE engine power supply for measuring the Engine Torque. For troubleshooting and diagnostic purposes, it is required that the following signals be monitored by the C&I system.

Torque Meter Power Supply Voltage: 0-500 mVAC.
Torque Meter Power Supply Current: 0-100 mA
Torque Meter Power Supply Output Frequency: 0-2000 Hz

In addition to these measurements, at least 16 spare channels for voltage, 8 spare channels for current, and 8 spare channels for frequency shall be provided.

Alarm Annunciators

The system shall include alarm annunciators for indicating when certain parameters fall outside of predetermined, configurable safety limits. The annunciators can be implemented with panel mounted lights or with virtual alarms (on the monitor screens). An audio alarm must accompany the alarm condition. The audio alarm shall be ergonomically balanced such that it makes the operators aware of the condition, but does not present an annoyance or irritation. Typical alarm annunciators are as follows:

Water Brake:

- Low Water Brake Pressure
- Low Water Level
- Low Bearing Water Flow
- High Water Brake Temperature
- Low Brake Oil Pressure
- Low Brake Oil Flow

Engine:

- Low Engine Oil Inlet Pressure
- Low Engine Oil Filter Out Pressure
- Low Engine Oil Level
- High Engine Oil Temperature
- Low Fuel Pressure
- Anti-Icing Pressure
- High Cell Oil Temperature
- Chip Detector #1
- Chip Detector #2
- Chip Detector #3
- T700 Fuel Bypass
- T700 Oil Filter Bypass
- T700 Low Fuel Boost Pressure
- T700 A/I Valve

In addition to the above annunciators, the system shall have the capacity for additional annunciators (at least 16), such that they could be easily inserted into C&I system to satisfy future requirements.

Annunciators shall blink until acknowledged by the operator, and shall stay lit thereafter until cleared. Clearing the annunciators shall be password protected. An annunciator test feature (button) shall be included such that when the test is executed, all annunciators are caused to blink.

Max Values

The C&I system must have the ability to store the maximum acquired reading and duration for a particular set of parameters during test, which can then be easily retrieved and displayed by a Quality Assurance inspector. These max values shall only be clearable when a key is inserted into an enabling key switch, available on the console, and which cannot be overridden by the operators. Testing of another engine shall not be possible until the max values are cleared by the Quality Assurance inspector (who holds the key). The parameters typically chosen for max values are:

PTIT/EGT/MGT

Load (Water Brake Torque)

Compressor Speed

Power Turbine Speed

Control and Stimulus Capabilities

The C&I system must provide the capability to control the Engine speed and water brake Torque manually using levers located in the Operator Control Room. In addition, automatic control via the software for stability must be included. Control levers shall have no delay or hysteresis between movement of the lever and movement of the corresponding drive mechanism.

The following Controls are required for this system.

1. PAS and LDS Levers for controlling the GE T700 Engine.
2. N1 and N2 Throttle Levers for controlling the Honeywell T55L712 Engine.
3. ECL for controlling the Honeywell T55GA714A Engine.
4. Load Control Levers for controlling the water brake Torque.
5. Control Knob for controlling the NP Demand.
6. Control Knob for controlling N2 Demand (T55 GA714A).
7. Panel Buttons and Switches for testing other Engine and Test Cell Functions.
8. Discrete Control Signal Outputs.

GE T700 Engine PAS and LDS Levers.

Two levers are required for controlling these spindles. It shall be left to the Test Cell contractor to determine the best means of interfacing the control levers to the hardware linkage provided by CCAD. In designing the interface, human factors and software override capabilities shall be considered.

Honeywell T55L712 Throttle and Power Turbine Speed Control

A control lever is required for controlling N1 speed of the T55L712 engine. A second lever is required for power turbine (N2) speed control. It shall be left to the Test Cell Contractor to determine the best means of interfacing the control levers to the hardware linkage provided by CCAD. In designing the interface, human factors and software override capabilities shall be considered.

Honeywell T55GA714A Engine Control Lever and N2 Knob.

This ECL is part of the Vendor Specific required components, as is the N2 Demand Knob. They are included as part of the Honeywell Operator Console package. The test cell contractor needs to verify with Honeywell whether or not the linkage and engine mounting hardware is included. If not, the test cell contractor shall be responsible for providing the interconnecting hardware.

Load Control Levers

Two Water Brake Control Lever(s) are required to control the Torque applied to the Engine Shaft. One lever shall control the water pressure entering the water brake, and the second controls the water leaving the water brake. These levers are to be located on the control console in the operator control room.

NP Demand Control Knob (GET700)

The NP Demand Control Knob is comprised of a 10-turn potentiometer with a 10% tap. The potentiometer range is ±15vdc.

Panel Buttons and Switches

The Operator console requires a bank of buttons/switches that allows the operator to control test cell and engine functions. A minimum of 64 are required, with a suggested minimum contact rating of 1 amp. Below is a list of example control signals requiring manual control via button/switch that shall be included:

Overspeed Test Switch –2 ea- (GE and T55GA714A Engines):

Air Start ON/OFF Control (All Engines):

Ignition ON/OFF Control (All Engines):

400Hz Power Supply ON/OFF Control (All Engines):

Engine Fuel Flow Valve Cutoff Switch (All Engines):

Test Cell Lighting Contactors – minimum of 6 ea.

Chip Detector Power

Alarm Test

Alarm Acknowledge

Manual Timer

Emergency Fire Suppression

Engine start and emergency fire suppression functions shall be protected by dual enabling key switches. The key switches shall also have at least one additional set of contacts (normally closed) to allow adjacent test cell start functions to be locked out when the keys are in the enable position.

Control Signal Outputs

The system shall provide a minimum of 8 control voltage outputs (0-10V) that can be programmed to provide PID control based on any variable measured by the C&I system, with a loop cycle time as short as 10 mSec. These control signals are intended to provide system flexibility for future expansion, or for solving open loop control problems that might present themselves. 4-20 ma and the PID software shall be supported with an autotune program, like ExperTune's Products. Each PID loop shall allow for characterizer for the process across the entire range (mutli PID's for the process).

Hardware and Software Filters

The C&I System must have the ability to implement a variety of hardware and software filters. The hardware filtering shall be included as part of the signal conditioning for each channel. A typical hardware filter shall be set to an anti-aliasing 3-pole low-pass frequency of 5 Hz, but other filter frequencies shall be available. Suggested filters are provided in the parameter table in Appendix C.

The ability to implement software filters is required, including the ability to use running averages and box-car averaging. An example of a typical software averaging algorithm is using 70% of the running average of a signal and 30% of the latest reading to produce the next displayed value. Other examples of desirable software filters include digital Butterworth and First-Order Lag filtering algorithms.

Special Connections

Special connectors are required for interfacing to the G.E. T700 Engines. The “E1” connector, located on the ECU, includes contacts for T4.5, overspeed test switch, NP demand, engine torque, torque match input and 400 Hz power supply monitoring. The mating connector for E1 is made especially for General Electric by Pile National, P/N BF8-1216-24SV-Y89. This connector may need to be purchased from G.E and will likely have long lead times. It is important to note that different versions of the engine may have different E1 pin-out definitions. The C&I system must have the capability of adapting to a number of different pin-out combinations for E1 through switching, conversion cables, or other means.

Similarly, the mate for the E3 connector, Pile National P/N BF8-1216-24SV06-Y70, is also especially made for G.E. This connector contains contacts for items such as ignition voltage and current, chip detectors, oil and fuel filter bypass switches, NP and NG tachometer outputs, and other signals.

Design and Construction

Standards

The C&I system shall utilize industry standards for instrumentation, interfaces, computers and software to the maximum extent possible. ISA standards and conventions shall be followed, especially with respect to the referencing of data acquisition channels and sensors.

Modularity and Interchangeability

The C&I system shall be modular in nature, allowing easy replacement and expansion of data acquisition modules, signal conditioning modules, sensor/transducers and control computers. Proprietary interfaces and architectures are discouraged and require specific approval by CCAD. Open architectures which allow integration and substitution of hardware from multiple instrumentation vendors are preferred. A design which reduces overall system footprint is also desirable. Each control room supports two test cells requiring typically 2-4 operators on-hand during engine testing. It is required that the data acquisition hardware and harness terminations be installed in no more than two 19" wide racks, with a maximum height of 6 ft. Operator consoles shall be no larger than 7 ft long and 28 inches deep (excluding work surface depth), with a desktop worksurface on the front of the consoles having a maximum depth of 18 inches.

Safety

The Test Cell Control and Instrumentation system must be capable of monitoring various discrete input signals to provide hardware safety interlock protection for control outputs to the Engines. Below is a list of the control outputs that require hardware interlock protection and their associated sensor inputs.

1. Engine speed, max throttle operator entry, and air-starter ignition relay (HS0805) controls: If any of the below conditions exist, or occur during testing,
    a. the Engine throttle speed automatically retards to idle,
    b. the operator is prevented from entering the max throttle value,
    c. starter ignition relay is disabled:

    Sensor Input Interlock Condition:

    1. Water Brake Bearing flow rate decreases below min level
    2. Water Brake Supply Pump Pressure decreases below min level.
    3. Gearbox Vibration sensor exceeds max limit
    4. Upper Power Turbine Vibration sensor exceeds max limit.
    5. Lower Power Turbine Vibration sensor exceeds max limit.
    6. Water Brake Vibration sensor exceeds max limit.
    7. Engine Lube Oil Pressure decreases below min limit & NG Speed is greater than 52%
    8. NP (N2) Engine Speed exceeds max Limit
    9. NG (N1) Engine Speed exceeds max limit
    10. Operator depresses the ESD Momentary Switch

    In addition, if the Operator Depresses the ESD Momentary Switch, the Fuel Valves controlling the engine inlet fuel (FV0022 and FV0022A) shall be shut off.

Once activated, the Interlock state shall remain until the problem is resolved and the software issues a "Reset" command via operator input.

In addition, the C&I system shall provide the following capabilities:

1. Continuous parameter limit checking of engine and test cell sensors.
2. Provide system actions resulting from limit alarms and automatically record all limit messages.
3. Provide a security system to prevent unauthorized access to operation, data, or system configuration.

Human Factors

The following ergonomic factors shall be addressed by the C&I system:

1. The C&I System shall provide an easy to use Graphical User Interface (GUI) for both the "Pilot" and "Co-Pilot" Operators.
2. Annunciators shall be large enough so that they are highly visible such that the operators can easily ascertain the nature of the alarm. As a goal, the audible alarm shall be evident but shall not be irritating.
3. The system shall have a small enough footprint that visitors to the test cell can easily pass through and there shall be ample work space for the operators.
4. Lighted buttons are preferred for use with console contact switches, providing a clear indication of the state of the switch.

Operation and Maintenance

Reliability

This supportability requirement includes all failures in which are critical to the proper operation and diagnostic capability of the C&I System. Under normal use and operation the C&I System shall not fail within 1500 hours of operation with a statistical certainty of 95%.

Service and Maintainability

Service and maintainability are important factors to be considered in the C&I design. The objective is to ensure that maintenance provisions are addressed during the design phase.

The C&I System shall be designed and constructed using standard hardware that will meet the following conditions.

1. Procured hardware shall, whenever possible, be standard off the shelf parts which can be replaced with short lead times (1-2 weeks).
2. Safety, Functionality, Reliability, Replacement Lead times and Cost are factors that shall be considered when purchasing hardware.
3. Equipment design shall facilitate rapid, positive fault detection and isolation of defective items.
4. All wiring, components and terminations shall be appropriately labeled, and the labeling shall match the system documentation.
5. Standard parts shall be used whenever practical. Components shall be replaceable as module packages, and configured for rapid removal and replacement.
6. Equipment requiring periodic calibration and adjustment must be readily accessible without disassembly.
7. Guides, tracks, or stops shall be provided as necessary to facilitate handling and prevent damage to equipment or injury to personnel.
8. Sharp edges and corners that present a personnel safety hazard or potential damage to clothing or equipment shall be suitably protected or rounded.
9. Equipment shall have integral lighting in maintenance areas, which would otherwise be poorly illuminated.

Supportability

All C&I hardware and software components shall be purchased from reputable, leading vendors in test and measurement instrumentation. Components chosen shall be expected to have long term support by the OEM. Vendors who have representation in the Corpus Christi area are preferred. The following additional C&I system supportability features are required:

1. Automatic self-tests during startup.
2. Diagnostic utilities for hardware troubleshooting
3. Modular construction for easy replacement of component parts.
4. Built-in utilities for simulating data for use in troubleshooting.
5. Complete documentation and drawings for all system hardware and software components, including test cell wiring diagrams, schematics and parts lists.

Calibration

All measuring instruments/devices/standards associated with the C&I system must be ordered with a calibration certificate. Periodic Calibration is required as per the OEM recommended calibration cycle. Calibration shall be compliant with ANSI/NCSL Z540-1. The test cell contractor shall provide a compliant calibration procedure for the entire C&I system.

Software shall be provided to facilitate calibration of all data acquisition channels. As a minimum, calibration limits for a particular input value shall be displayed, and measured values shall be color coded as they are displayed in real-time according to whether the measured values pass or fail the limits. Calibration standards will be provided by CCAD for temperature, pressure, voltage and frequency. Special or unusual calibration requirements shall be addressed and provided for by the test cell contractor prior to CDR. Any correction factors used that are accessible via software shall be password protected.

Self Test

The C&I system must be capable of performing a self test on the control and measurement devices within the system. Smart instrumentation shall have the ability to conduct internal self tests and report the results when the system self test is executed. As a minimum, each channel of the data acquisition system must have the capability to read a built-in test signal, such as a reference voltage, for self test purposes.

Familiarization and Training

Upon completion of the test cell C&I implementation, the test cell contractor shall familiarize the test cell operators with the sensors, harnessing, and data acquisition instrumentation used on the three different engine types. The test cell contractor shall also be responsible for providing training to the operators on the use of the C&I system, to include normal operations, calibration, self test, diagnostics and repair. The duration of this training period shall be for ten (10) training days for four (4) CCAD students.

APPENDIX C: C&I PARAMETER TABLES AND DIAGRAMS

NOTES:

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

Tag #	Used On	Signal Name	Tag #	Used On	Signal Name	Tag #	Used On	Signal Name
001	ABC	INLET AIR TOTAL PRESS #1 (PT1)	148	C	GEARBOX PRESSURE	531	A	OIL SCAV. TEMP. A-SUMP FWD
005	ABC	B/M THROAT STATIC # 1 PRESS. (PS1)	150	ABC	W/B LUBE OIL SUPPLY PRESSURE	532	A	OIL SCAV. TEMP. A-SUMP AFT
013	ABC	AIR START PRESSURE	152	B	POWER TURBINE BEARING OIL SCAV NEG PRESS	533	A	OIL SCAV. TEMP. B-SUMP AFT
013	ABC	AIR START ON/OFF CONTROL		C	BEARING 4&5 OIL SCAVENGE NEGATIVE PRESSURE	534	A	OIL SCAV. TEMP. C-SUMP FWD
014	A	IPS (PARTICLE SEP.)	201	ABC	FUEL SPECIFIC GRAVITY	535	A	OIL SCAV. TEMP. C-SUMP AFT
015	ABC	FAC W/B WATER FLOW RATE	202	ABC	ABSOLUTE HUMIDITY	536	A	OIL SCAV. TEMP. AUX GEARBX
016	ABC	W/B BEARING OIL FLOW RATE	351	ABC	VIBRATION CHANNEL NO. 1	568	ABC	W/B Rear Bearing Oil ScavengeTemp. No 1
018	ABC	FUEL MASS FLOW (Wf)	352	ABC	VIBRATION CHANNEL NO.2 (GearBox / IPX)	569	ABC	W/B Rear Bearing Oil ScavengeTemp. No 2
019	ABC	FUEL MASS FLOW (Wf)	353	ABC	VIBRATION CHANNEL NO.3 (High Aft)	570	ABC	W/B Forward Bearing Oil Scavenge Temp.
020	ABC	W/B BEARING H20 FLOW RATE	354	ABC	VIBRATION CHANNEL NO.4 (Low Aft)	571	ABC	W/B WATER IN TEMP.
021	ABC	W/B AIR FLOW RATE	356	ABC	VIBRATION CHANNEL NO. 6 (Water Pump)	572	ABC	W/B WATER OUT TEMP.
052	A	CUSTOMER BLEED	403	B	T55L712 ENGINE TORQUE	573	ABC	COOLING TWR BASIN H20 TEMP.
065	ABC	ENGINE LUBE OIL FLOW	407	A	LOAD DEMAND SPINDLE (LDS)	576	A	ENGINE ANTI-ICE TEMP.
101	ABC	FAC FUEL FILTER PRESSURE-UPSTREAM		B	POWER LEVER POSITION	579	BC	ENGINE OIL TEMP. BULB
				C	ENGINE CONTROL LEVER POSITION	601	ABC	FAC LUBE OIL LEVEL (PRES)
117	B	GEAR BOX PRESSURE	408	AB	POWER AVAILABLE SPINDLE (PAS)	602	ABC	COLD WATER LEVEL
118	A	B-SUMP SCAVENGE PRESSURE	409	A	STAGE 1 VANE ANGLE	701A	A	Np FOR T700 ENGINES
119	A	COMPRESSOR DISC. PRESSURE (PS3)	410	ABC	W/B STRAINGAGE		C	NPT FOR T55GA714A ENGINES
	B	COMPRESSOR DISCHARGE PRESSURE #1 (PS3)	415	A	T700 ENGINE TORQUE	701B	B	N2 FOR T556712 ENGINES
	C	COMBUSTOR STATIC PRESSURE		C	T55GA714A ENGINE TORQUE	702A	A	Ng FOR T700 ENGINES
121	BC	FUEL CONTROL PUMPPRESSURE	420	A	TORQUE MATCH INPUT INDICATION		C	NGG FOR T55GA714A ENGINES
122	ABC	FAC FUEL SUPPLY PRESSURE	501	ABC	ENGINE EXHAUST TEMP. RAKE (6 TCs)	702B	B	N1 FOR T55L712 ENGINES
123	BC	FAC FUEL SUPPLY PRESSURE	507	C	OIL COOLER INLET TEMP	703	A	NP DEMAND
125	A	FUEL BOOST PRESSURE	509	BC	TURBINE SCAV. OIL TEMP.		C	N2 SET KNOB
126	ABC	ENGINE OIL DISCHARGE PRESS (EODP)	510	BC	#2 BEAR. SCAV. OIL TEMP.	803	ABC	400Hz Power Supply On/Off Control
128	A	EXHAUST STATIC PRESS. (PS9)	511	C	OIL COOLER OUT TEMP.	805	ABC	Ignition Voltage On/Off Control
130	ABC	W/B PUMP PRESSURE	512	C	ENGINE OIL OUT TEMP.	901	ABC	GEARBOX CHIP DETECTOR
131	ABC	W/B IN WATER PRESSURE	513	C	OIL CAL. LOOP TEMP.	902	BC	POWER TURBINE OIL SCAVENGE DETECTOR
132	ABC	W/B OUT WATER PRESSURE	515	A	INLET AIR TEMP. (T0)	903	BC	NO. 2 BEARING OIL SCAVENGE DETECTOR
140	ABC	BAROMETER PRESSURE	516	BC	INLET AIR TEMP.(T55) (T0)	904	A	ANTI-ICING BLEED AND START VALVE IND
141	A	P3 BOROSCOPE PRESSURE (PS3-X)	524	A	COMP. DISC. TEMP. (T700) (TT3)	905	A	OIL FILTER BYPASS INDICATION
	B	COMPRESSOR DISCHARGE PRESSURE #2 (PS3)	525	BC	COMP. DISC. TEMP. (T55) (TT3)	906	A	FUEL FILTER BYPASS INDICATION
	C	COMBUSTOR INLET TOTAL PRESSURE	526	ABC	POWER TURBINE INLET TEMP (T4.5H / PTT)	907	ABC	OVERSPEED TEST SWITCH #1
144	ABC	FACILITY LUBE OIL PRESSURE	527	A	OIL SCAV. TEMP. B-SUMP FWD	908	ABC	OVERSPEED TEST SWITCH #2
147	BC	REAR BEARING OIL INLET PRESSURE	528	A	ENGINE OIL DISC. TEMP. (EODT)	915	ABC	HYD SYSTEM TEMP ALARM

TAG NAMING CONVENTION

COLUMN	
1	Measurment Type
2	Transducer Type
3,4,5,6	Sequentional No. 0000 - 9999
7	Suffix for Multiple Sensors on Same Channel (ie A,B…)

Measurment Types

P	Pressure
T	Temperature
W	Torque
F	Flow
V	Vibration
L	Level
S	Frequency
E	Voltage Sense
I	Current Sense
H	Hand (Not Controlled or Monitored by S/W)
Z	User Defined

Transducer Types

E	Element (Thermocouple, RTD, Strain Gage, accelerometer)
T	Transducer (Pressure)
V	Valve
I	GUI Display
G	Gage
S	Switch

Sequence

000-099	Flow Measurement Channels
0100-0199	Pressure Measurment Channels
0200-0299	Not Used
0300-0399	Vibration Measurement Channels
0400-0499	Torque Measurment Channels
0500-0599	Temperature Measurement Channels
0600-0699	Fluid Level Measurment Channels
0700-0799	Frequency/Period Measurment Channels
0800-0899	Discrete Inputs Channels
0900-0999	Discrete Output Channels

Used On Code

A	GE T700 Series Engines
B	Honeywell T55-L712 Engines
C	Honewell T55-GA-714A Engines

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES		
DIGITS	POSITION	FEATURE
.X	.1	.1
.XX	.02	.01
.XXX	.005	.005
.XXXX	.0005	.0005
ANGLES	.5	-

APPLICATION	
NEXT ASSY	USED ON

CONTRACT: 1PKQ8	DATE	E-Spectrum technologies INTELLIGENT INSTRUMENTATION
DRAWN BY: JWEIBLEN	08/27/03	12725 Spectrum Drive San Antonio, TX 78249 (210) 696-8848
CHECKED :		CCAD DATA ACQUISITION SYSTEM
ENGINEER:		SENSOR TAG NAMES
ACCEPTED:		SIZE D · DWG NO. 1134-9001 · REV 1 · SCALE 1/1 · SHEET 4 OF 4

APPENDIX D: COMPUTER SYSTEM I.T. REQUIREMENTS

Network Communications. Contractor shall provide communications from console to government specified server and file system through a separate computer provided by CCAD Information Technology (IT).

CCAD will provide fully tested Ethernet cabling and equipment from the test cell to specified server and file system. Contractor will receive host Internet Protocol (IP) addresses and additional IP configuration information, network accounts and permissions upon approval of physical and information security requests.

Contractor shall coordinate configuration and testing procedures with CCAD's Information Technology Division, Directorate for Resources prior to Critical Design Review. POCs will be provided to contractor prior to Preliminary Design Review.

Acceptance of network communications shall include a review of systems log files, visual inspection of system and network configurations, examination of network traffic emanating to and from the console, connectivity to network file system, ability to read and write to this file system, inspection of files to ascertain reliable transmission of both printer and delimited ASCII file sets. File sets will be examined to correlate data on printer file with delimited ASCII file.

Failure in network availability will be tested to ensure that logic of contractor provided scripts writes unique file sets to local storage on console.

Section C - Descriptions and Specifications

CLAUSES INCORPORATED BY FULL TEXT

HQ C-1-0001 - DATA REQUIREMENTS (NAVSEA) (SEP 1992)

The data to be furnished hereunder shall be prepared in accordance with the Contract Data Requirements List, DD Form 1423, attached hereto in Section J.

CLAUSES INCORPORATED BY FULL TEXT

HQ C-2-0008 - ASSIGNMENT AND USE OF NATIONAL STOCK NUMBERS (NAVSEA) (MAY 1993)

To the extent that National Stock Numbers (NSNs) or preliminary NSNs are assigned by the Government for the identification of parts, pieces, items, subassemblies or assemblies to be furnished under this contract, the Contractor shall use such NSNs or preliminary NSNs in the preparation of provisioning lists, package labels, packing lists, shipping containers and shipping documents as required by applicable specifications, standards or Data item Descriptions of the contract or as required by orders for spare and repair parts. The cognizant Government Contract Administration Office shall be responsible for providing the Contractor such NSNs or preliminary NSNs which may be assigned and which are not already in possession of the Contractor.

HQ C-2-0011 - COMPUTER SOFTWARE AND/OR COMPUTER DATABASE(S) DELIVERED TO AND/OR RECEIVED FROM THE GOVERNMENT (NAVSEA) (NOV 1996)

(a) The Contractor agrees to test for viruses all computer software and/or computer databases, as defined in the clause entitled "RIGHTS IN NONCOMMERCIAL COMPUTER SOFTWARE AND NONCOMMERCIAL COMPUTER SOFTWARE DOCUMENTATION" (DFARS 252.227-7014), before delivery of that computer software or computer database in whatever media and on whatever system the software is delivered. The Contractor warrants that any such computer software and/or computer database will be free of viruses when delivered.

(b) The Contractor agrees to test any computer software and/or computer database(s) received from the Government for viruses prior to use under this contract.

(c) Unless otherwise agreed in writing, any license agreement governing the use of any computer software to be delivered as a result of this contract must be paid-up and perpetual, or so nearly perpetual as to allow the use of the computer software or computer data base with the equipment for which it is obtained, or any replacement equipment, for so long as such equipment is used. Otherwise the computer software or computer data base does not meet the minimum functional requirements of this contract. In the event there is any routine to disable the computer software or computer data base in the future, that date certain shall not be less than 25 years after the delivery date of the computer software or computer database.

(d) No copy protection devices or systems shall be used in any computer software or computer database delivered under this contract to restrict or limit the Government from making copies. This does not prohibit license agreements from specifying the maximum amount of copies that can be made.

(e) Delivery by the Contractor to the Government of certain technical data and other data is now frequently required in digital form rather than as hard copy. Such delivery may cause confusion between data rights and computer software rights. It is agreed that, to the extent that any such data is computer software by virtue of its delivery in digital form, the Government will be licensed to use that digital-form data with exactly the same rights and limitations as if the data had been delivered as hard copy.

(f) Any limited rights legends or other allowed legends placed by a Contractor on technical data or other data delivered in digital form shall be digitally included on the same media as the digital-form data and must be associated with the corresponding digital-form technical data to which the legends apply to the extent possible. Such legends shall also be placed in humanform on a visible surface of the media carrying the digital-form data as delivered, to the extent possible.

HQ C-2-0014 CONTRACTOR'S PROPOSAL (NAVSEA) (MAR 2001)

(a) Performance of this contract by the Contractor shall be conducted and performed in accordance with detailed obligations to which the Contractor committed itself in Proposal _____ dated _____ in response to NAVSEA Solicitation No. N00174-____ _____.

(b) The technical volume(s) of the Contractor's proposal is incorporated by reference and hereby made subject to the provisions of the "ORDER OF PRECEDENCE" (FAR 52.215-8) clause of this contract. Under the "ORDER OF PRECEDENCE" clause, the technical volume of the Contractor's proposal referenced herein is hereby designated as item (f) of the clause, following "the specification" in the order of precedence.

HQ C-2-0033 - LIMITATION OF LIABILITY - HIGH VALUE ITEMS (NAVSEA) (JUN 1992)

The following items are subject to the clause of this contract entitled "LIMITATION OF LIABILITY--HIGH VALUE ITEMS" (FAR 52.246-24): __

HQ C-2-0034 - MINIMUM INSURANCE REQUIREMENTS (NAVSEA) (SEP 1990)

In accordance with the clause of this contract entitled "INSURANCE--WORK ON A GOVERNMENT INSTALLATION" (FAR 52.228-5), the Contractor shall procure and maintain insurance, of at least the kinds and minimum amounts set forth below:

(a) Workers' Compensation and Employer's Liability coverage shall be at least $100,000, except as provided in FAR 28.307(a).

(b) Bodily injury liability insurance coverage shall be written on the comprehensive form of policy of at least $500,000 per occurrence.

(c) Automobile Liability policies covering automobiles operated in the United States shall provide coverage of at least $200,000 per person and $500,000 per occurrence for bodily injury and $20,000 per occurrence for property damage. The amount of liability coverage on other policies shall be commensurate with any legal requirements of the locality and sufficient to meet normal and customary claims.

HQ C-2-0038 - PERMITS AND RESPONSIBILITIES (NAVSEA) (SEP 1990)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any applicable Federal, State, and Municipal laws, codes, and regulations, in connection with any movement over the public highways of overweight/over dimensional materials.

Section D - Packaging and Marking

CLAUSES INCORPORATED BY FULL TEXT

HQ D-2-0004 - IDENTIFICATION MARKING OF PARTS (NAVSEA) (NOV 1996)

Identification marking of individual parts within the systems, equipments, assemblies, subassemblies, components, groups, sets or kits, and of spare and repair parts shall be done in accordance with applicable specifications and drawings. To the extent identification marking of such parts is not specified in applicable specifications or drawings, such marking shall be accomplished in accordance with the following:

(1) Parts shall be marked in accordance with generally accepted commercial practice.

(2) In cases where parts are so small as not to permit identification marking as provided above, such parts shall be appropriately coded so as to permit ready identification.

CLAUSES INCORPORATED BY FULL TEXT

IHD 31 - MARKING OF SHIPMENTS (COMMERCIALLY PACKAGED ITEMS)(NAVSEA/IHD) FEB 2000

(a) Marking shall be in accordance with ASTM D 3951-90,
"Commercial Packaging of Supplies and Equipment."

(b) Additional markings are stated below:

Contract No: N00174-05-C-

Bldg:

Code:

*Note: When the item is over 1000 lbs the contractor is to stencil the weight on the crate

Section E - Inspection and Acceptance

CLAUSES INCORPORATED BY FULL TEXT

HQ E-1-0001 - INSPECTION AND ACCEPTANCE LANGUAGE FOR DATA

Inspection and acceptance of all data shall be as specified on the attached Contract Data Requirements List(s), DD Form 1423.

CLAUSES INCORPORATED BY FULL TEXT

HQ E-2-0005 - INSPECTION AND ACCEPTANCE LANGUAGE FOR F.O.B. DESTINATION (NAVSEA)

Item(s) **ALL** - Inspection and acceptance shall be made at destination by a representative of the Government.

IHD 49 - INSPECTION AND ACCEPTANCE (DESTINATION) (NAVSEA/IHD) (FEB 2000)

Inspection and acceptance of the supplies or services to be furnished hereunder shall be made at destination by the receiving activity.

Section F - Deliveries or Performance

CLAUSES INCORPORATED BY FULL TEXT

IHD 61 - PLACE OF DELIVERY: DESTINATION (NAVSEA/IHD) FEB 2000

(a) The articles to be furnished hereunder shall be delivered all transportation charges paid by the contractor to:

CORPUS CHRISTI ARMY DEPOT
CORPUS CHRISTI TEXAS

(b) Bids submitted on a basis other than F.O.B. Destination will be rejected as non-responsive and proposals may be deemed unacceptable.

Section G - Contract Administration Data

CLAUSES INCORPORATED BY REFERENCE

252.242-7000 Postaward Conference DEC 1991

CLAUSES INCORPORATED BY FULL TEXT

NAPS 5252.232-9000 SUBMISSION OF INVOICES (FIXED PRICE) (JUL 1992)

(a) "Invoice" as used in this clause does not include contractor requests for progress payments.

(b) The contractor shall submit original invoices with copies to the address identified in the- solicitation/ contract award form (SF 26-Block 10; SF 33-Block 23; SF 1447-Block 14), unless delivery orders are applicable, in which case invoices will be segregated by individual order and submitted to the address specified in the order (DD 1155-Block 13 or SF 26-Block 10).

(c) The use of copies of the Material Inspection and Receiving Report (MIRR), DD Form 250, as an invoice is encouraged. DFARS Appendix F-306 provides instructions for such use. Copies of the MIRR used as an invoice are in addition to the standard distribution stated in DFARS F-401.

(d) In addition to the requirements of the Prompt Payment clause of this contract, the contractor shall cite on each invoice the contract line item number (CLIN); the contract subline item number (SLIN), if applicable; the accounting classification reference number (ACRN) as identified on the financial accounting data sheets, and the payment terms.

(e) The contractor shall prepare:

___ a separate invoice for each activity designated to receive the supplies or services.

___ a consolidated invoice covering all shipments delivered under an individual order.

_X_ either of the above.

(f) If acceptance is at origin, the contractor shall submit the MIRR or other acceptance verification directly to the designated payment office. If acceptance is at destination, the consignee will forward acceptance verification to the designated payment office.

INVOICE MAILING INSTRUCTIONS

(To be completed by Contract Specialist)

MAIL INVOICES TO: _____

_____

_____

_____

HQ G-2-0003 - CONTRACT ADMINISTRATION DATA LANGUAGE (NAVSEA)

(a) Electronic Funds Transfer (EFT) Payment Requirements

FAR 52.232-33, MANDATORY INFORMATION FOR ELECTRONIC FUNDS TRANSFER PAYMENT, is included in this solicitation/contract. All Contractor payments will be made by EFT unless excepted or otherwise determined by the paying office designated in the contract.

The Contractor must initiate enrollment in EFT by contacting the paying office designated in the contract and requesting form SF 3881, Automated Clearing House (ACH) Vendor/Miscellaneous Payment Enrollment Plan. This form must be completed by the Contractor and their financial institution and returned to the paying office. The paying office will complete the process and notify the Contractor that EFT enrollment is complete. All payments under this contract will be held until the Contractor provides the required EFT enrollment information.

(b) Enter below the address (street and number, city, county, state and zip code) of the Contractor's facility which will administer the contract if such address is different from the address shown on the SF 26 or SF 33, as applicable.

_____

_____

IHD 6 CONTRACT POINTS OF CONTACT (NAVSEA/IHD)

The following contacts are provided for this contract:

Contract Administrator:	TBD
Phone Number:	(301)744-
Payments/Invoicing:	TBD
Phone Number:	(301)744-
Technical Representative:	Mark Stefanowicz
Phone Number:	(717) 605-4393

Any concerns regarding your contract, should be directed to the above mentioned personnel, or the Contracting Officer Renee Brown at (301) 744-6653.

IHD 76 - INDIAN HEAD DIVISION, NAVAL SEA SYSTEMS COMMAND, HOURS OF OPERATION AND HOLIDAY SCHEDULE (NAVSEA/IHD) FEB 2000

1. The policy of this station is to schedule periods of reduced operations or shutdown during holiday periods. Deliveries will not be accepted on Saturdays, Sundays or Holidays except as specifically requested by the Naval Sea Systems Command. All goods or services attempted to be delivered on a Saturday, Sunday or Holiday

without specific instructions from the Contracting Officer or his duly appointed representative will be returned to the contractor at his expense with no cost or liability to the U.S. Government.

2. The scheduled holidays for Indian Head Division, Naval Sea Systems Command are:

HOLIDAY	DATE OF OBSERVANCE
New Year's Day	01 January
Martin Luther King's Birthday	19 January
President's Day	16 February
Memorial Day	31 May
Independence Day	5 July
Labor Day	6 September
Columbus Day	11 October
Veteran's Day	11 November
Thanksgiving Day	25 November
Christmas Day	24 December

* If the actual date falls on a Saturday, the holiday will be observed the preceding Friday. If the holiday falls on a Sunday, the observance shall be on the following Monday.

3. The hours of operation for the Contracts Division and Receiving Branch are as follows:

AREA	FROM	TO
Contracts Division (BLDG. 1558)	7:30 A.M.	4:00 P.M.
Receiving Branch (BLDG. 116)	7:30 A.M	11:00 A.M
	12:30 P.M.	2:00 P.M.

If you intend to visit the Contracts Division, it is advised that you call for an appointment at least 24 hours in advance.

Section H - Special Contract Requirements

CLAUSES INCORPORATED BY FULL TEXT

5252.227-9113 GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM (AUG 1997)

(a) The Contractor shall participate in the appropriate interchange of the Government-Industry Data Exchange Program (GIDEP) in accordance with NAVSEA S0300-BU-GYD-010 dated November 1994. Data entered is retained by the program and provided to qualified participants. Compliance with this requirement shall not relieve the Contractor from complying with any other requirement of the contract.

(b) The Contractor agrees to insert paragraph (a) of this requirement in any subcontract hereunder exceeding $500,000.00. When so inserted, the word "Contractor" shall be changed to "Subcontractor".

(c) GIDEP materials, software and information are available without charge from:

GIDEP Operations Center
P.O. Box 8000
Corona, CA 91718-8000

Phone: (909) 273-4677 or DSN 933-4677
FAX: (909) 273-5200
Internet: http://www.gidep.corona.navy.mil

(End of Text)

CLAUSES INCORPORATED BY FULL TEXT

5252.245-9109 GOVERNMENT-FURNISHED PROPERTY (INCORPORATION) (SEP 1990)

The Government will provide only that property set forth below, notwithstanding any term or condition of this contract to the contrary. Upon Contractor's written request to the cognizant Technical Program Manager, via the cognizant Contract Administration Office, the Government will furnish the following for incorporation in the equipment to be delivered under Item(s) _____ of this contract:

(End of Text)

IHD 1 - CONTRACTOR PERFORMANCE ASSESSMENT RATING SYSTEM (CPARS) NAVSEA/IHD (JAN 2001)

(a) Pursuant to FAR 42.1502, this contract is subject to DoD's Contractor Performance Assessment System (CPARS). CPARS is an automated centralized information system accessible via the Internet that maintains reports of contractor performance for each contract. CPARS is located at http://www.nslcptsmh.navsea.navy.mil/. Further information on CPARS is available at that web-site.

(b) Under CPARS, the Government will conduct annual evaluations of the contractor's performance. The contractor has thirty (30) days after the Government's evaluation is completed to comment on the evaluation. The opportunity to review and comment is limited to this time period and will not be extended. Failure to review the report at this time will not prevent the Government from using the report.

(c) The contractor may request a meeting to discuss the CPAR. The meeting is to be requested via e-mail to the CPARS Program Manager no later than seven days following receipt of the CPAR. A meeting will then be held during the contractor's 30-day review period.

(d) The CPARS system requires the Government to assign the contractor a UserID and password in order to view and comment on the evaluation. Provide the name(s) of at least one individual (not more than three) that will be assigned as your Defense Contractor Representative for CPARS.

Name	Phone	E-mail Address (optional)

NOTICE OF INCORPORATION OF SECTIONS K, L, AND M (NAVSEA/IHD) FEB 2000

The following sections of the solicitation will not be distributed with the contract; however, they are incorporated in and form a part of the resultant contract as though furnished in full text therewith:

SECTION	TITLE
K	Representations, Certifications and Other Statements of Offerors (Bidders)
L	Instructions, Conditions, and Notices to Offerors (Bidders)
M	Evaluation Factors for Award

IHD 114 - CONTRACTING OFFICER'S REPRESENTATIVE (COR) (NAVSEA/IHD) FEB 2000

(a) The COR for this contract is:

Name: Mailing Address:
Code:

(b) The Alternate COR for this contract is:
Name: Mailing Address:
Code: Telephone No.:

(c) The COR will act as the Contracting Officer's representative for technical matters, providing technical direction and discussion, as necessary, with respect to the specification or statement of work, and monitoring the progress and quality of contractor performance. The COR is not an Administrative Contracting Officer and does not have authority to direct the accomplishment of effort which is beyond the scope of the statement of work in the contract (or delivery order).

(d) When, in the opinion of the contractor, the COR requests effort outside the existing scope of the contract (or delivery order), the contractor shall promptly notify the contracting officer (or ordering officer) in writing. No action shall be taken by the contractor under such direction until the contracting officer has issued a modification to the contract (or in the case of a delivery order, until the ordering officer has issued a modification to the delivery order); or until the issue has been otherwise resolved.

(e) In the event that the COR named above is absent due to leave, illness or official business, all responsibility and functions assigned to the COR will be the responsibility of the alternate COR.

IHD 123 - SF 294 AND SF 295 REPORTING REQUIREMENTS (FEB 2000)(NAVSEA/IHD)

(1) SF 294 Subcontracting Report for Individual Contracts:

This report is required for each contract containing a Subcontracting Plan. Semi-Annually during contract performance for the periods ending March 31st and September 30th. A separate report is required for each contract at contract completion. Reports are due 30 days after the close of each reporting period unless otherwise directed by the contracting officer.

(2) SF 295 Summary Subcontract Report:

This report must be submitted semi-annually during contract performance for the six months ending March 31st and the twelve months ending September 30th. Reports are due 30 days after the close of each reporting period.

(NOTE: Use Special Instructions for Commercial Products Plans, see back of SF 295.)

(3) SF 294 and SF 295 shall be submitted to the following personnel:

Name/Address/Title	Submit SF294	Submit SF295
1. Contracting Officer (address shown on page 1 of contract document)	yes-original	yes - original
2. NAVSEA, IHD Small Business Specialist Code SB 101 Strauss Avenue Indian Head, MD. 20640-5035	yes-copy	yes - copy
3. DCMAO	yes-original	yes-original

(address shown on page
1 of contract document)

IHD 126 - GOVERNMENT-FURNISHED PROPERTY (FEB 2000) (NAVSEA/IHD)

(a) The Government will furnish the following property to the Contractor for use in performance of this contract in accordance with the following schedule:

CCAD T55L712 Internal Engine Torque Meter Signal Conditioner (T55GA712 Engines)
All Engine Temperature and Oil Sensors
GE T700 PAS, LDS, and Stage1 Vane Angle encoder engine mounting H/W.
Honeywell T55L712 N1 and N2 encoder engine mounting H/W.

(b) The property will be delivered at the Governments expense at or near (**The contractor is to insert the address, city or town and state in which the plant is located; and if rail transportation is specified in paragraph (a) above, the exact location of private siding or public team track at which rail shipments will be received, as well as the name of the railroad(s)):**

(c) Only the property listed above in the quantity shown will be furnished by the Government. All other property required for performance of this contract shall be furnished by the contractor.

(d) Within 30 days after Government furnished property is determined by the contractor to be lost, damaged, destroyed, no longer usable, or no longer needed for the performance of the contract, the Contractor shall notify the Contracting Officer, in writing, thereof.

(NOTE SPECIALIST - PARAGRAPH (B) CAN BE MODIFIED TO REFLECT CONTRACTORS EXPENSE

Section I - Contract Clauses

CLAUSES INCORPORATED BY FULL TEXT

52.215-10 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)

(a) If any price, including profit or fee, negotiated in connection with this contract, or any cost reimbursable under this contract, was increased by any significant amount because--

(1) The Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data;

(2) A subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data; or

(3) Any of these parties furnished data of any description that were not accurate, the price or cost shall be reduced accordingly and the contract shall be modified to reflect the reduction.

(b) Any reduction in the contract price under paragraph (a) of this clause due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which--

(1) The actual subcontract; or

(2) The actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.

(c)(1) If the Contracting Officer determines under paragraph (a) of this clause that a price or cost reduction should be made, the Contractor agrees not to raise the following matters as a defense:

(i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted.

(ii) The Contracting Officer should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the Contracting Officer.

(iii) The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract.

(iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.

(2)(i) Except as prohibited by subdivision (c)(2)(ii) of this clause, an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if--

(A) The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and

(B) The Contractor proves that the cost or pricing data were available before the “as of” date specified on its Certificate of Current Cost or Pricing Data, and that the data were not submitted before such date.

(ii) An offset shall not be allowed if--

(A) The understated data were known by the Contractor to be understated before the “as of” date specified on its Certificate of Current Cost or Pricing Data; or

(B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the “as of” date specified on its Certificate of Current Cost or Pricing Data.

(d) If any reduction in the contract price under this clause reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall pay the United States at the time such overpayment is repaid--

(1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Contractor at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and

A penalty equal to the amount of the overpayment, if the Contractor or subcontractor knowingly submitted cost or pricing data that were incomplete, inaccurate, or noncurrent.

(End of clause)

52.217-7 OPTION FOR INCREASED QUANTITY--SEPARATELY PRICED LINE ITEM (MAR 1989)

The Government may require the delivery of the numbered line item, identified in the Schedule as an option item, in the quantity and at the price stated in the Schedule. The Contracting Officer may exercise the option by written notice to the Contractor within 2 years after date of contract awrd for Option I and 365 days thereafter per subsequest Option.. Delivery of added items shall continue at the same rate that like items are called for under the contract, unless the parties otherwise agree.

(End of clause)

52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (OCT 2004)

(a) Definition. HUBZone small business concern, as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

(b) Evaluation preference. (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except--

(i) Offers from HUBZone small business concerns that have not waived the evaluation preference;

(ii) Otherwise successful offers from small business concerns;

(iii) Otherwise successful offers of eligible products under the Trade Agreements Act when the dollar threshold for application of the Act is exceeded (see 25.402 of the Federal Acquisition Regulation (FAR)); and

(iv) Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) A concern that is both a HUBZone small business concern and a small disadvantaged business concern will receive the benefit of both the HUBZone small business price evaluation preference and the small disadvantaged business price evaluation adjustment (see FAR clause 52.219-23). Each applicable price evaluation preference or adjustment shall be calculated independently against an offeror's base offer.

These individual preference amounts shall be added together to arrive at the total evaluated price for that offer.

(c) Waiver of evaluation preference. A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) of this clause do not apply if the offeror has waived the evaluation preference.

___ Offeror elects to waive the evaluation preference.

(d) Agreement. A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.

(e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.

(f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (OCT 2004)

(a) Definition. HUBZone small business concern, as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

(b) Evaluation preference. (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except--

(i) Offers from HUBZone small business concerns that have not waived the evaluation preference;

(ii) Otherwise successful offers from small business concerns;

(iii) Otherwise successful offers of eligible products under the Trade Agreements Act when the dollar threshold for application of the Act is exceeded (see 25.402 of the Federal Acquisition Regulation (FAR)); and

(iv) Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) A concern that is both a HUBZone small business concern and a small disadvantaged business concern will receive the benefit of both the HUBZone small business price evaluation preference and the small disadvantaged business price evaluation adjustment (see FAR clause 52.219-23). Each applicable price evaluation preference or adjustment shall be calculated independently against an offeror's base offer.

These individual preference amounts shall be added together to arrive at the total evaluated price for that offer.

(c) Waiver of evaluation preference. A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) of this clause do not apply if the offeror has waived the evaluation preference.

___ Offeror elects to waive the evaluation preference.

(d) Agreement. A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.

(e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.

(f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (DEC 2004)

(a) Definitions.

"Commercial item", has the meaning contained in Federal Acquistion Regulation 2.101, Definitions.

"Subcontract", includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.

(b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.

(c) (1) The Contractor shall insert the following clauses in subcontracts for commercial items:

(i) 52.219-8, Utilization of Small Business Concerns (MAY 2004) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds $500,000 ($1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(ii) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era and Other Eligible Veterans (DEC 2001) (38 U.S.C. 4212(a)).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793).

(v) 52.222-39, Notification of Employee Rights Concerning Payment of Union Dues or Fees (DEC 2004) (E.O. 13201). Flow down as required in accordance with paragraph (g) of FAR clause 52.222-39).

(vi) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (APR 2003) (46 U.S.C. Appx 1241 and 10 U.S.C. 2631) (flow down required in accordance with paragraph (d) of FAR clause 52.247-64).

(2) While not required, the Contractor may flow down to subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract.

(End of clause)

52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

http://www.arnet.gov/far/
http://www.acq.osd.mil/dp/dars/dfars/dfars.html

(End of clause)

252.232-7003 ELECTRONIC SUBMISSION OF PAYMENT REQUESTS (JAN 2004)

(a) Definitions. As used in this clause--

(1) Contract financing payment and invoice payment have the meanings given in section 32.001 of the Federal Acquisition Regulation.

(2) Electronic form means any automated system that transmits information electronically from the initiating system to all affected systems. Facsimile, e-mail, and scanned documents are not acceptable electronic forms for submission of payment requests. However, scanned documents are acceptable when they are part of a submission of a payment request made using one of the electronic forms provided for in paragraph (b) of this clause.

(3) Payment request means any request for contract financing payment or invoice payment submitted by the Contractor under this contract.

(b) Except as provided in paragraph (c) of this clause, the Contractor shall submit payment requests using one of the following electronic forms:

(1) Wide Area WorkFlow-Receipt and Acceptance (WAWF-RA). Information regarding WAWF-RA is available on the Internet at https://wawf.eb.mil.

(2) Web Invoicing System (WInS). Information regarding WInS is available on the Internet at https://ecweb.dfas.mil.

(3) American National Standards Institute (ANSI) X.12 electronic data interchange (EDI) formats.

(i) Information regarding EDI formats is available on the Internet at http://www.X12.org.

(ii) EDI implementation guides are available on the Internet at http://www.dfas.mil/ecedi.

(4) Another electronic form authorized by the Contracting Officer.

(c) If the Contractor is unable to submit a payment request in electronic form, or DoD is unable to receive a payment request in electronic form, the Contractor shall submit the payment request using a method mutually agreed to by the Contractor, the Contracting Officer, the contract administration office, and the payment office.

(d) In addition to the requirements of this clause, the Contractor shall meet the requirements of the appropriate payment clauses in this contract when submitting payments requests.

(End of clause)

252.251-7000 ORDERING FROM GOVERNMENT SUPPLY SOURCES (NOV 2004)

(a) When placing orders under Federal Supply Schedules, Personal Property Rehabilitation Price Schedules, or Enterprise Software Agreements, the Contractor shall follow the terms of the applicable schedule or agreement and authorization. Include in each order:

(1) A copy of the authorization (unless a copy was previously furnished to the Federal Supply Schedule, Personal Property Rehabilitation Price Schedule, or Enterprise Software Agreement contractor).

(2) The following statement: Any price reductions negotiated as part of an Enterprise Software Agreement issued under a Federal Supply Schedule contract shall control. In the event of any other inconsistencies between an Enterprise Software Agreement, established as a Federal Supply Schedule blanket purchase agreement, and the Federal Supply Schedule contract, the latter shall govern.

(3) The completed address(es) to which the Contractor's mail, freight, and billing documents are to be directed.

(b) When placing orders under nonmandatory schedule contracts and requirements contracts, issued by the General Services Administration (GSA) Office of Information Resources Management, for automated data processing equipment, software and maintenance, communications equipment and supplies, and teleprocessing services, the Contractor shall follow the terms of the applicable contract and the procedures in paragraph (a) of this clause.

(c) When placing orders for Government stock, the Contractor shall --

(1) Comply with the requirements of the Contracting Officer's authorization, using FEDSTRIP or MILSTRIP procedures, as appropriate;

(2) Use only the GSA Form 1948-A, Retail Services Shopping Plate, when ordering from GSA Self-Service Stores;

(3) Order only those items required in the performance of Government contracts; and

(4) Pay invoices from Government supply sources promptly. For purchases made from DoD supply sources, this means within 30 days of the date of a proper invoice (see also Defense Federal Acquisition Regulation Supplement (DFARS) 251.105). For purchases made from DoD supply sources, this means within 30 days of the date of a proper invoice. The Contractor shall annotate each invoice with the date of receipt. The Contractor's failure to pay may also result in the DoD supply source refusing to honor the requisition (see DFARS 251.102(f)) or in the Contracting Officer terminating the Contractor's authorization to use DoD supply sources. In the event the Contracting Officer decides to terminate the authorization due to the Contractor's failure to pay in a timely manner, the Contracting Officer shall provide the Contractor with prompt written notice of the intent to terminate the authorization and the basis for such action. The Contractor shall have 10 days after receipt of the Government's notice in which to provide additional information as to why the authorization should not be terminated. The termination shall not provide the Contractor with an excusable delay for failure to perform or complete the contract in accordance with the terms of the contract, and the Contractor shall be solely responsible for any increased costs.

(d) Only the Contractor may request authorization for subcontractor use of Government supply sources. The Contracting Officer will not grant authorizations for subcontractor use without approval of the Contractor.

(e) Government invoices shall be submitted to the Contractor's billing address, and Contractor payments shall be sent to the Government remittance address specified below:

Contractor's Billing Address [include point of contact and telephone number]:

Government Remittance Address (include point of contact and telephone number) :

(End of clause)

Section J - List of Documents, Exhibits and Other Attachments

SECTION J
DD 1423
SECURITY REQUIREMENTS FOR CONTRACTOR PERSONNEL

Section K - Representations, Certifications and Other Statements of Offerors

CLAUSES INCORPORATED BY REFERENCE

52.203-11	Certification And Disclosure Regarding Payments To Influence Certain Federal Transactions	APR 1991
52.222-38	Compliance With Veterans' Employment Reporting Requirements	DEC 2001
252.209-7001	Disclosure of Ownership or Control by the Government of a Terrorist Country	SEP 2004

CLAUSES INCORPORATED BY FULL TEXT

52.203-2 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985)

(a) The offeror certifies that --

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to –

(i) Those prices,

(ii) The intention to submit an offer, or

(iii) The methods of factors used to calculate the prices offered:

(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory --

(1) Is the person in the offeror's organization responsible for determining the prices offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision; or

(2) (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) of this provison _____ (insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization);

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) of this provision.

(c) If the offeror deletes or modifies subparagraph (a)(2) of this provision, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

(End of clause)

52.204-3 TAXPAYER IDENTIFICATION (OCT 1998)

(a) Definitions.

“Common parent,” as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

“Taxpayer Identification Number (TIN),” as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

___ TIN:._____

___ TIN has been applied for.

___ TIN is not required because:

___ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

___ Offeror is an agency or instrumentality of a foreign government;

___ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

___ Sole proprietorship;

___ Partnership;

___ Corporate entity (not tax-exempt);

___ Corporate entity (tax-exempt);

___ Government entity (Federal, State, or local);

___ Foreign government;

___ International organization per 26 CFR 1.6049-4;

___ Other _____

(f) Common parent.

___ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

___ Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) (MAY 1999)

(a) Definition. Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) Representation. [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program Representations, of this solicitation.] The offeror represents that it ( ) is a women-owned business concern.

(End of provision)

52.209-5 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (DEC 2001)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that-

(i) The Offeror and/or any of its Principals-

(A) Are ( ) are not ( ) presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have ( ) have not ( ), within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(C) Are ( ) are not ( ) presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision.

(ii) The Offeror has ( ) has not ( ), within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of provision)

52.219-1 SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2004) - ALTERNATE I (APR 2002)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 336413.

(2) The small business size standard is 1000.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it ( ) is, ( ) is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, that it ( ) is, ( ) is not a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a women-owned small business concern.

(4) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a veteran-owned small business concern.

(5) (Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.) The offeror represents as part of its offer that it ( ) is, ( ) is not a service-disabled veteran-owned small business concern.

(6) [Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.] The offeror represents, as part of its offer, that--

(i) It ( ) is, ( ) is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It ( ) is, ( ) is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. (The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture:_____.) Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) (Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision.) The offeror shall check the category in which its ownership falls:

____ Black American.

____ Hispanic American.

____ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

____ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

____ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

____ Individual/concern, other than one of the preceding.

(c) Definitions. As used in this provision--

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern," means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

Veteran-owned small business concern means a small business concern--

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern," means a small business concern --

(1) That is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; or

(2) Whose management and daily business operations are controlled by one or more women.

(d) Notice.

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, HUBZone small, small disadvantaged, or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to section 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall--

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

(End of provision)

52.222-18 CERTIFICATION REGARDING KNOWLEDGE OF CHILD LABOR FOR LISTED END PRODUCTS (FEBRUARY 2001)

(a) Definition.

Forced or indentured child labor means all work or service--

(1) Exacted from any person under the age of 18 under the menace of any penalty for its nonperformance and for which the worker does not offer himself voluntarily; or

(2) Performed by any person under the age of 18 pursuant to a contract the enforcement of which can be accomplished by process or penalties.

(b) Listed end products. The following end product(s) being acquired under this solicitation is (are) included in the List of Products Requiring Contractor Certification as to Forced or Indentured Child Labor, identified by their country of origin. There is a reasonable basis to believe that listed endproducts from the listed countries of origin may have been mined, produced, or manufactured by forced or indentured child labor.

Listed End Product

Listed Countries of Origin

(c) Certification. The Government will not make award to an offeror unless the offeror, by checking the appropriate block, certifies to either paragraph (c)(1) or paragraph (c)(2) of this provision.

( ) (1) The offeror will not supply any end product listed in paragraph (b) of this provision that was mined, produced, or manufactured in a corresponding country as listed for that end product.

( ) (2) The offeror may supply an end product listed in paragraph (b) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product. The offeror certifies that it has made a good faith effort to determine whether forced or indentured child labor was used to mine, produce, or manufacture such end product. On the basis of those efforts, the offeror certifies that it is not aware of any such use of child labor.

(End of provision)

52.222-22 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999)

The offeror represents that --

(a) ( ) It has, ( ) has not participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation;

(b) ( ) It has, ( ) has not, filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

52.222-25 AFFIRMATIVE ACTION COMPLIANCE (APR 1984)

The offeror represents that

(a) [ ] it has developed and has on file, [ ] has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2), or

(b) [ ] has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

(End of provision)

52.223-13 CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)

(a) Executive Order 13148, of April 21, 2000, Greening the Government through Leadership in Environmental Management, requires submission of this certification as a prerequisite for contract award.

(b) By signing this offer, the offeror certifies that--

(1) As the owner or operator of facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject to the Form R filing and reporting requirements because each such facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

( ) (i) The facility does not manufacture, process, or otherwise use any toxic chemicals listed in 40 CFR 372.65;

( ) (ii) The facility does not have 10 or more full-time employees as specified in section 313.(b)(1)(A) of EPCRA 42 U.S.C. 11023(b)(1)(A);

( ) (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

( ) (iv) The facility does not fall within the following Standard Industrial Classification (SIC) codes or their corresponding North American Industry Classification System sectors:

(A) Major group code 10 (except 1011, 1081, and 1094.

(B) Major group code 12 (except 1241).

(C) Major group codes 20 through 39.

(D) Industry code 4911, 4931, or 4939 (limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce).

(E) Industry code 4953 (limited to facilities regulated under the Resource Conservation and Recovery Act, Subtitle C (42 U.S.C. 6921, et seq.), 5169, 5171, or 7389 (limited to facilities primarily engaged in solvent recovery services on a contract or fee basis); or

( ) (v) The facility is not located within the United States or its outlying areas.

(End of clause)

52.230-1 COST ACCOUNTING STANDARDS NOTICES AND CERTIFICATION (JUN 2000)

Note: This notice does not apply to small businesses or foreign governments. This notice is in three parts, identified by Roman numerals I through III.

Offerors shall examine each part and provide the requested information in order to determine Cost Accounting Standards (CAS) requirements applicable to any resultant contract.

If the offeror is an educational institution, Part II does not apply unless the contemplated contract will be subject to full or modified CAS coverage pursuant to 48 CFR 9903.201-2(c)(5) or 9903.201-2(c)(6), respectively.

I. DISCLOSURE STATEMENT--COST ACCOUNTING PRACTICES AND CERTIFICATION

(a) Any contract in excess of $500,000 resulting from this solicitation will be subject to the requirements of the Cost Accounting Standards Board (48 CFR Chapter 99), except for those contracts which are exempt as specified in 48 CFR 9903.201-1.

(b) Any offeror submitting a proposal which, if accepted, will result in a contract subject to the requirements of 48 CFR Chapter 99 must, as a condition of contracting, submit a Disclosure Statement as required by 48 CFR 9903.202. When required, the Disclosure Statement must be submitted as a part of the offeror's proposal under this solicitation unless the offeror has already submitted a Disclosure Statement disclosing the practices used in connection with the pricing of this proposal. If an applicable Disclosure Statement has already been submitted, the offeror may satisfy the requirement for submission by providing the information requested in paragraph (c) of Part I of this provision.

CAUTION: In the absence of specific regulations or agreement, a practice disclosed in a Disclosure Statement shall not, by virtue of such disclosure, be deemed to be a proper, approved, or agreed-to practice for pricing proposals or accumulating and reporting contract performance cost data.

(c) Check the appropriate box below:

(1) Certificate of Concurrent Submission of Disclosure Statement.

The offeror hereby certifies that, as a part of the offer, copies of the Disclosure Statement have been submitted as follows: (i) original and one copy to the cognizant Administrative Contracting Officer (ACO) or cognizant Federal agency official authorized to act in that capacity (Federal official), as applicable, and (ii) one copy to the cognizant Federal auditor.

(Disclosure must be on Form No. CASB DS-1 or CASB DS-2, as applicable. Forms may be obtained from the cognizant ACO or Federal official and/or from the loose-leaf version of the Federal Acquisition Regulation.)

Date of Disclosure Statement: _____ Name and Address of Cognizant ACO or Federal Official Where Filed: _____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the Disclosure Statement.

(2) Certificate of Previously Submitted Disclosure Statement.

The offeror hereby certifies that the required Disclosure Statement was filed as follows:

Date of Disclosure Statement: _____ Name and Address of Cognizant ACO or Federal Official Where Filed: _____

The offeror further certifies that the practices used in estimating costs in pricing this proposal are consistent with the cost accounting practices disclosed in the applicable Disclosure Statement.

(3) Certificate of Monetary Exemption.

The offeror hereby certifies that the offeror, together with all divisions, subsidiaries, and affiliates under common control, did not receive net awards of negotiated prime contracts and subcontracts subject to CAS totaling more than $50 million (of which at least one award exceeded $1 million) in the cost accounting period immediately preceding the period in which this proposal was submitted. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

(4) Certificate of Interim Exemption.

The offeror hereby certifies that (i) the offeror first exceeded the monetary exemption for disclosure, as defined in (3) of this subsection, in the cost accounting period immediately preceding the period in which this offer was submitted and (ii) in accordance with 48 CFR 9903.202-1, the offeror is not yet required to submit a Disclosure Statement. The offeror further certifies that if an award resulting from this proposal has not been made within 90 days after the end of that period, the offeror will immediately submit a revised certificate to the Contracting Officer, in the form specified under subparagraph (c)(1) or (c)(2) of Part I of this provision, as appropriate, to verify submission of a completed Disclosure Statement.

CAUTION: Offerors currently required to disclose because they were awarded a CAS-covered prime contract or subcontract of $50 million or more in the current cost accounting period may not claim this exemption (4).

Further, the exemption applies only in connection with proposals submitted before expiration of the 90-day period following the cost accounting period in which the monetary exemption was exceeded.

II. COST ACCOUNTING STANDARDS--ELIGIBILITY FOR MODIFIED CONTRACT COVERAGE

If the offeror is eligible to use the modified provisions of 48 CFR 9903.201-2(b) and elects to do so, the offeror shall indicate by checking the box below. Checking the box below shall mean that the resultant contract is subject to the Disclosure and Consistency of Cost Accounting Practices clause in lieu of the Cost Accounting Standards clause.

( ) The offeror hereby claims an exemption from the Cost Accounting Standards clause under the provisions of 48 CFR 9903.201-2(b) and certifies that the offeror is eligible for use of the Disclosure and Consistency of Cost Accounting Practices clause because during the cost accounting period immediately preceding the period in which this proposal was submitted, the offeror received less than $50 million in awards of CAS-covered prime contracts and subcontracts. The offeror further certifies that if such status changes before an award resulting from this proposal, the offeror will advise the Contracting Officer immediately.

CAUTION: An offeror may not claim the above eligibility for modified contract coverage if this proposal is expected to result in the award of a CAS-covered contract of $50 million or more or if, during its current cost accounting period, the offeror has been awarded a single CAS-covered prime contract or subcontract of $25 million or more.

III. ADDITIONAL COST ACCOUNTING STANDARDS APPLICABLE TO EXISTING CONTRACTS

The offeror shall indicate below whether award of the contemplated contract would, in accordance with subparagraph (a)(3) of the Cost Accounting Standards clause, require a change in established cost accounting practices affecting existing contracts and subcontracts.

( ) YES ( ) NO

(End of clause)

252.209-7001 DISCLOSURE OF OWNERSHIP OR CONTROL BY THE GOVERNMENT OF A TERRORIST COUNTRY (SEP 2004)

(a) "Definitions."

As used in this provision --

(a) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for such acts of international terrorism. As of the date of this provision, terrorist countries subject to this provision include: Cuba, Iran, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means --

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street

names," or some other method of holding securities that does not disclose the beneficial owner;

(ii) Holding a management position in the firm, such as a director or officer;

(iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;

(iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v) Holding 50 percent or more of the indebtness of a firm.

(b) "Prohibition on award."

In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary or, in the case of a subsidiary, the firm that owns the subsidiary, unless a waiver is granted by the Secretary of Defense.

(c) "Disclosure."

If the government of a terrorist country has a significant interest in the Offeror or a subsidiary of the Offeror, the Offeror shall disclosure such interest in an attachment to its offer. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include --

(1) Identification of each government holding a significant interest; and

(2) A description of the significant interest held by each government.

(End of provision)

252.225-7000 BUY AMERICAN ACT--BALANCE OF PAYMENTS PROGRAM CERTIFICATE (APR 2003)

(a) Definitions. Domestic end product, foreign end product, qualifying country, and qualifying country end product have the meanings given in the Buy American Act and Balance of Payments Program clause of this solicitation.

(b) Evaluation. The Government--

(1) Will evaluate offers in accordance with the policies and procedures of Part 225 of the Defense Federal Acquisition Regulation Supplement; and

(2) Will evaluate offers of qualifying country end products without regard to the restrictions of the Buy American Act or the Balance of Payments Program.

(c) Certifications and identification of country of origin.

(1) For all line items subject to the Buy American Act and Balance of Payments Program clause of this solicitation, the offeror certifies that--

(i) Each end product, except those listed in paragraph (c)(2) or (3) of this provision, is a domestic end product; and

(ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

(2) The offeror certifies that the following end products are qualifying country end products:

(Line Item Number Country of Origin)

(Country of Origin)

(3) The following end products are other foreign end products:

(Line Item Number)

(Country of Origin) (If known)

(End of provision)

252.225-7003 REPORT OF INTENDED PERFORMANCE OUTSIDE THE UNITED STATES (APR 2003)

(a) The offeror shall submit a Report of Contract Performance Outside the United States, with its offer, if--

(1) The offer exceeds $10 million in value; and

(2) The offeror is aware that the offeror or a first-tier subcontractor intends to perform any part of the contract outside the United States and Canada that--

(i) Exceeds $500,000 in value; and

(ii) Could be performed inside the United States or Canada.

(b) Information to be reported includes that for--

(1) Subcontracts;

(2) Purchases; and

(3) Intracompany transfers when transfers originate in a foreign location.

(c) The offeror shall submit the report using--

(1) DD Form 2139, Report of Contract Performance Outside the United States; or

(2) A computer-generated report that contains all information required by DD Form 2139.

(d) The offeror may obtain a copy of DD Form 2139 from the Contracting Officer.

(End of provision)

252.227-7028 TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT (JUN 1995)

The Offeror shall attach to its offer an identification of all documents or other media incorporating technical data or computer software it intends to deliver under this contract with other than unlimited rights that are identical or substantially similar to documents or other media that the Offeror has produced for, delivered to, or is obligated to deliver to the Government under any contract or subcontract. The attachment shall identify--

(a) The contract number under which the data or software were produced;

(b) The contract number under which, and the name and address of the organization to whom, the data or software were most recently delivered or will be delivered; and

(c) Any limitations on the Government's rights to use or disclose the data or software, including, when applicable, identification of the earliest date the limitations expire.

(End of clause)

252.247-7022 REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992)

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term supplies is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) Representation. The Offeror represents that it:

____ (1) Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

____ (2) Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

(End of provision)

Section L - Instructions, Conditions and Notices to Bidders

CLAUSES INCORPORATED BY REFERENCE

52.204-6	Data Universal Numbering System (DUNS) Number	OCT 2003
52.211-6	Brand Name or Equal	AUG 1999
52.215-1	Instructions to Offerors--Competitive Acquisition	JAN 2004
52.237-1	Site Visit	APR 1984
252.227-7017	Identification and Assertion of Use, Release, or Disclosure Restrictions	JUN 1995
252.227-7028	Technical Data or Computer Software Previously Delivered to the Government	JUN 1995

CLAUSES INCORPORATED BY FULL TEXT

52.211-14 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be DX rated order; X DO rated order certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation. [Contracting Officer check appropriate box.]

(End of provision)

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a FIRM FIXED PRICE contract resulting from this solicitation.

(End of clause)

52.233-2 SERVICE OF PROTEST (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from Renee M. Brown, NAVSEA Indian Head, 101 Strauss Avenue, Bldg. 1558, Indian Head, MD 20640.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of provision)

52.252-1 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The offeror is cautioned that the listed provisions may include blocks that must be completed by the offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

www.arnet.gov

(End of provision

HQ L-2-0005 - NOTIFICATION OF POTENTIAL ORGANIZATIONAL CONFLICT(S) OF INTEREST (NAVSEA) (JUN 1994)

(a) Offerors are reminded that certain existing contractual arrangements may preclude, restrict or limit participation, in whole or in part, as either a subcontractor or as a prime contractor under this competitive procurement. Of primary concern are those contractual arrangements in which the Offeror provides support to , or related laboratories (if applicable), in support of operation of the office or any of its programs. General guidance may be found in FAR 9.505; however, this guidance is not all inclusive. The Offeror's attention is directed to the "Organizational Conflict of Interest" (or similar) requirement which may be contained in current or completed contract(s) which prohibits the prime or subcontractor from providing certain supplies or services to the Government as described above during the period of the current "support" contract(s) or for a period after completion of the "support" contract(s). Notwithstanding the existence or non-existence of an Organizational Conflict of Interest (OCI) clause or similar requirement in current or completed contract(s), the offeror shall comply with FAR 9.5 and identify whether an OCI exists and not rely solely on the presence of an OCI requirement.

(b) If a potential conflict of interest exists at any tier, each potential prime offeror is requested to notify the Contracting Officer within 14 days of the date of this solicitation. The Offeror shall provide: (1) the contract number and name and phone number of the Contracting Officer for the contract which gives rise to a potential organizational conflict of interest; (2) a copy of the requirement; (3) the statement of work (or technical instruction) from the existing contract; (4) a brief description of the type of work to be performed by each subcontractor under the competitive procurement; and (5) any additional information the Contracting Officer should consider in making a determination of whether a conflict of interest exists. The Government may independently verify the information received from the offeror. Notwithstanding the above, the Government reserves the right to determine whether a conflict of interest exists based on any information received from any source.

(c) The Government will notify an offeror of any conflict of interest within 14 days of receipt of all required information. Those offerors deemed to have a conflict of interest may be ineligible for award. Failure to provide the information in a timely manner does not waive the Government's rights to make a conflict of interest determination. The offeror is notified that if it expends time and money on proposal preparation, such expenditure is at its own risk that the Government will not determine that an organizational conflict of interest exists.

(d) Any potential prime contractor which proposes a subcontractor later determined to have a conflict of interest and deemed ineligible to participate in the current competition, may not be granted the opportunity to revise its proposal to remove the ineligible subcontractor. The Government reserves the right to determine which offerors remain in the competitive range through the normal source selection process.

(e) If the offeror determines that a potential organizational conflict of interest does not exist at any tier, the offeror shall include a statement to that effect in its response to this solicitation.

HQ L-2-0009 - SMALL BUSINESS SUBCONTRACTING PLAN (NAVSEA) (JUN 1999)

Offeror shall submit as part of its proposal a written proposed subcontracting plan in accordance with the clause entitled "SMALL BUSINESS SUBCONTRACTING PLAN" (FAR 52.219-9). The plan shall include the Congressionally mandated five percent (5%) goal for small disadvantaged business concerns or a detailed explanation as to why the goal cannot be included in the plan.

HQ L-2-0010 - SUBSTITUTION OF PREVIOUSLY APPROVED SINGLE PROCESS INITIATIVE (NAVSEA) (MAY 1998)

Your proposal shall identify where you are substituting your previously approved Single Process Initiative (SPI) processes for specified requirements. In addition, offerors shall provide the information required by DFARS 252.211-7005, paragraph (c).

IHD 195 - SECTION L PROPOSAL REQUIREMENTS (FEB 2000) (NAVSEA/IHD)

GENERAL INFORMATION: Each offeror must submit an offer/proposal and other written information in strict accordance with these instructions. When evaluating an offeror the Government will consider how well the offeror complied with both the letter and spirit of these instructions. The Government will consider any failure on the part of the offeror to comply with both the letter and the spirit of these instructions to be an indication of the type of conduct it can expect during contract performance. Therefore, the Government encourages offerors to contact the contracting officer by telephone, facsimile transmission, e-mail, or mail in order to request an explanation of any aspect of these instructions. The procurement is being conducted on a best value basis utilizing the tradeoff process. The government intends to award a single contract as a result of this solicitation.

A. OFFERORS SHALL PROVIDE THE FOLLOWING INFORMATION:

Volume I - Offer/Proposal (2 copies)

Completion of blocks 12 through 18 of the SF33 by the Offeror which indicates consent and agreement to the Statement of Work and all clauses applicable to each section
Section B CLIN prices inserted by the Offeror
Sections A through j of the solicitation completed, all requested information provided and returned by the Offeror in its entirety with no exceptions taken. Any exceptions would have to be cured through discussions at the discretion of the Contracting Officer.
Acceptance via signature of all amendments

These items constitute the Offeror's assent to the terms of the RFP and the Offeror's proposed prices or estimated cost and fee. By submitting these items, a promise is made by the Offeror to accede to the terms and conditions of the RFP and complete the specified work in accordance with those terms and conditions.

Volume II - **Technical Information** (6 copies) – This volume shall contain no pricing information

1. The technical proposal shall set forth the proposed solution to meeting the statement of objectives as well as the tasks involved in the design, engineering, manufacture, testing and operational characteristics to meet the requirements. The offeror shall demonstrate their capability to provide appropriate plans, drawings, brochures, test results and other documentation as required by the statement of work. Technical proposals submitted must contain precise information. Each such proposal must be adequate to demonstrate an understanding of requirements, how it is proposed to comply with them, and the ability to deliver a system that will perform to them. All proposal content shall be directed toward validating the competency/capability of the offeror in the performance of the contract to be awarded. The Government shall not assume that an offeror possesses any capability other than that specified in the proposal. All aspects of the Statement of Objectives shall be addressed such as:

Meets design objectives and performance specifications.

Seamless integration of system with existing ATETS, CCAD LAN

Remote system status / diagnostics & security

Ability to capture & trend transient & steady-state data

Load applier selected increases stability over existing systems.

Describe how you intend to support the documentation requirements.

Technical Proposal Variations/Alternatives - The requirements listed are the minimum for design to meet the performance capabilities of the specification and do not intend to prohibit or restrict the choice of configuration, materials used, or the functional operation of the system as long as the stated criteria are met.

The technical proposals shall include a written response to all requirements of the statement of work. Each paragraph and subsection of the statement of work shall be addressed by number and title.

As part of the technical proposal, the offeror shall submit a proposed project schedule identifying the project milestones in relation to the contract award date. A flow-chart showing the steps to be taken in preparing and coordinating each submittal to the government. A Gantt chart schedule for all activities from date of contract award through installation, startup and training. Milestones are to be assigned to submittal, design, fabrication, programming, assembly, pre-delivery testing, deliveries, installation, field testing, start-up, calibration, acceptance testing and training dates. The schedule shall be subdivided to show activities relative to each major item or group of items when everything in a given group is on the same schedule. The proposal shall include Gantt chart showing all activities and milestones. Provide flow chart showing submittal process.

Provide a list the proposed personnel and their qualifications and experience in providing systems of this type

Provide a list of major equipment required for the project.

2. Development/Manufacturing/Facilities Capability

Each offeror shall provide a detailed description of their existing capability to develop, manufacture and install engine test cells that will meet the requirements set forth in the Statement of Work. Include a list of manufactured products that demonstrates their manufacturing capability. Also provide detailed information about requirement similarities between the current/former program(s) and this program, information about the test

capabilities and actual delivery schedule, and whether there were any delays or problems with the program(s). The description should also include information about the program(s) duration and sponsor. Identify any foreseeable problem areas in the manufacturing set up process (i.e., offeror's facilities and/or capabilities) that could affect the delivery schedule. Plans the offeror has to eliminate them? If no problems, why?
Provide information as to the location of your facility(s). If it is anticipated that more than one facility will be utilized (i.e. East and West Coasts), then it shall be so indicated. Included shall be the square footage dedicated for the efforts and specific equipment located at the facility(s), which will be utilized to support the requirements of this contract. In addition, the Offeror shall attest to the adequacy of these facilities and equipment to provide supportive documentation and drawings. If any of the listed facilities or equipment is contingent on this contract award, it shall be so indicated. The Offeror must show that the facility will be available within thirty (30) days after award.

3. Experience

Provide a description of engine test cells that your facility has design, developed and installed in the past or is currently working on. Specifically address your experience with the development and installation of the following key requirements of the test cell being procured:

Offerors are required to demonstrate having 10+ years experience designing/integrating/ installing/startup of this particular instrumentation.

Offeror are required to demonstrate having 10+ years designing turboshaft engine test cells.

4. Quality Assurance

Provide a copy of your company's Quality Assurance Program Plan. Identify the quality and process controls that will be used to ensure that the end item will be in compliance with the applicable drawing, specifications, SOW, Appendix and contract. Describe the type of documentation that will be used to identify, record and disposition non-conforming material, in-process rejects and characteristic discrepancies. The program shall emphasize organized methodologies and standards, including American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE) and International Organization for Standardization (ISO) standards. The program shall include the following aspects at a minimum:

System of traceability of manufactured unit and system software throughout development, production and testing.

Demonstrated record of prompt positive response to field failures.

Record of prompt shipments in accordance with contract obligations.

Documented program of failure analysis.

Quality assurance organization, which complies with MIL-Q-9858A or equivalent program and utilizes MIL-HDBK- 217F, FAR 52.246.11.

Warranty covering parts and labor and a guaranteed system clause having a 99.9 percent minimum availability based on a two (2) hour MTTR.

Documented product safety policy relevant to all products intended to be furnished under this Contract.

Volume III – Past Performance (1 copy)

1 PAST PERFORMANCE (Past Performance shall be evaluated by the contracting officer or a designee)

Past Performance is a measure of the degree to which an Offeror, as an organization, has during the past three (3) years: (1) satisfied its customers, and (2) complied with federal, state, and local laws and regulations. The Government will inquire about (1) customer satisfaction, (2) timeliness, (3) technical success, (4) program management, and (5) quality. Offeror shall provide a minimum of three references. This factor is rated by contracting personnel.

Past Performance shall be rated based on the following:

Excellent - The Offeror's performance was consistently superior. The contractual performance was accomplished with minor problems, to which corrective action taken by the contractor was highly effective.

Good - The Offeror's performance was better than average. The contractual performance was accomplished with some minor problems, to which corrective actions taken by the contractor were effective. They would be willing to do business with the Offeror again.

Average- The Offeror's performance was adequate. The contractual performance reflects a problem, to which the contractor has not yet identified corrective actions. Consideration would take part in awarding a contract to the Offeror again.

Poor - The Offeror's performance was entirely inadequate. The contractual performance of the element being assessed contains problems, to which the contractor's corrective actions appear to be or were ineffective. They would not do business with the Offeror again under any circumstances.
Neutral - Offerors lacking relevant past performance history will receive a neutral rating for past performance.

The Offeror must provide the information requested above for past performance evaluation or affirmatively state that it possesses no relevant directly related or similar past performance. An offer that fails to provide the past performance information may be considered ineligible for award.

Volume IV – **Price** (2 Copies)

Price is not the most important evaluation factor. The price proposal shall include the completed solicitation document and any available pricing information to facilitate the price analysis that will be performed in evaluating the proposal (i.e., cost breakdown, catalog pricing, past pricing history, etc.). The price/cost information shall include data regarding the general financial condition of the Offeror and specific plans for financing the proposed contract. The Government does not intend to provide any financial assistance. The Offeror shall furnish the name, location, and point of contact of the assigned DCAA office as part of the price/cost information. This factor is rated by contracting personnel.

In volume IV, in addition to pricing information, offerors shall also submit a completed Representation & Certification; an acknowledgement of Clause HQ-L-2-0005 - Notification of Potential Organization Conflict(s) of Interest (NAVSEA)(JUN 1994), see paragraph (e) requirement; and for Large Business offeror a Small Business Sub-Contracting Plan..

Section M - Evaluation Factors for Award

CLAUSES INCORPORATED BY REFERENCE

52.217-5	Evaluation Of Options	JUL 1990

CLAUSES INCORPORATED BY FULL TEXT

HQ M-2-0006 - EVALUATION OF PREVIOUSLY APPROVED SINGLE PROCESS INITIATIVE (NAVSEA) (NOV 1996)

Previously approved Single Process Initiative (SPI) processes will be evaluated under the source selection criteria of the RFP. If the successful offeror has previously approved SPI processes in the proposal, those SPI processes will be incorporated into the contract upon award.

IHD 211 - SECTION M BEST VALUE EVALUATION AND BASIS FOR AWARD (FFP) (MAR 2000) (NAVSEA/IHD)

The contract resulting from this solicitation will be awarded to that responsible offeror whose offer, conforming to the solicitation, is determined most advantageous to the Government price and other factors considered. The offeror's proposal shall be in the form prescribed by this solicitation and shall contain a response to each of the areas. Proposals will be evaluated and rated against the factors listed below, in descending order of importance:

Technical Information
Past Performance
Cost/Price

As technical proposals become more equal, past performance and price will become more significant factors. With respect to technical proposal, past performance and price, the Government is more interested in obtaining technical excellence and superior performance than lowest price. However, the Government will not pay a price premium that it considers disproportionate to the benefits associated with the proposed margin of technical excellence and superior performance. In determining best overall value, the Government will first assess an offeror on the basis of Technical proposal and then compare and rank offerors on the basis of past performance. Then the Government will compare the tradeoffs between relative margins of technical ranking, performance and price. The offer who represents the best value will be the offeror who represents the best tradeoff between technical excellence, superior performance and price.

The Offerors' submission in response to Volume II – Technical Information shall be reviewed by the technical review team. Each sub-factor shall be reviewed based on the merits of the information contained in the Offerors' submission. The technical review team will only examine technical material contained within Volume I. Each factor shall be reviewed and assigned a score for each of the following Technical Information sub-factors:

Technical Proposal, Assigned a range of 0 to 40 points
Development/Manufacturing/Facilities Capability, Assigned a range of 0 to 30 points
Experience, Assigned a range of 0 to 20 points
Quality Assurance, Assigned a range of 0 to 10 points

Evaluation of Factor 2 - Past Performance information and the Factor 3 - Price shall be by the Procurement Department personnel at NSWC Indian Head.

Volume II - Factor 2: Past Performance, Assigned a descriptor rating as detailed herein
Volume III - Factor 3: Price, Not scored

Once all evaluations are complete the corresponding scores shall be tabulated and placed in a chart as follows in this example:

Offeror	Technical Score * Factor 1	Past Performance Rating Factor 2	Cost/Price Factor 3
A	88	Excellent	$2.6M
B	93	Excellent	$2.8M
C	0**	Good	$2.1M
D	82	Excellent	$2M
E	93	Poor	$1.6M

* Not to exceed 100
** Offeror did not comply with RFP instructions – such as failing to submit a complete Volume I – was not evaluated.
Once this information is tabulated, Offerors will be compared making value and price tradeoffs and award will be made to the Offeror that represents the Best Value to the Government. If the Offeror with the highest scores also represents the lowest price then that Offeror is likely to be the Best Value. If an Offeror with higher scores has a higher price, then a determination must be made whether the difference in value is worth the higher price

SINGLE OFFEROR

In the event where the Government only receives one proposal submission, the Government reserves the right to award only if: (1) the Offeror receives a total Technical score of 70 or higher and (2) the Offeror's price is determined to be fair and reasonable for the Technical score received. Predicated on the Offeror meeting the specified Technical score and determination of price being fair and reasonable, only then will the Offeror be eligible for award.

CORPUS CHRISTI ARMY DEPOT 2002

SECURITY REQUIREMENTS FOR CONTRACT PERSONNEL
IAW CCAD 1901, NASCORPC INST.5500.6C, NASCORPCLNST 11320.8J

CONDUCT AND BEHAVIOR

All personnel entering, working at the NAVAL AIR STATION and CORPUS CHRISTI ARMY DEPOT are subject to all rules, regulations and applicable laws.

OBEDIENCE TO MILITARY AND CIVILIAN SECURITY POLICE

No person will willfully fail or refuse to comply with lawful orders or direction of any security police officer civilian or military invested by the US Government and Commanding Officer.

Disrespectful behavior, failure to obey rules, orders, regulations, fighting, horseplay, stealing, drugs, alcohol, illegal weapons are prohibited and subject to penalties under proper authorities. To include being banned from entering any US Government facility.

RESPONSIBILITIES:

1. OBSERVE AND OBEY ALL TRAFFIC SIGNS

All personnel will abide by all traffic, parking rules and regulations.
Failure to abide will result with issuance of US Government armed forces citations and appropriate disciplinary action.

Personal employee vehicles will be parked in proper parking lot spaces.
All angled parking is head in, parking or traveling against the flow of traffic is prohibited.

Parking in fire lanes, grass areas, in front of doors or buildings where vehicles are not allowed is not permitted.

Vehicles are allowed to load and unload equipment at the job site but moved away when not loading or unloading.

Permission to park Company support vehicles within the perimeters of the job must be cleared through the COR and Security.

Company support vehicles must have company identification and be in direct support of the job.

Vehicles are prohibited from being driven inside the depot complex, buildings and hangars.

Parking behind hangars must be cleared by the COR, NAS FIRE DEPT./ CCAD FIRE MARSHALL and CCAD SECURITY.

Vehicles cleared to be in the Hangar flight line must travel in the fire lane have a flight line driver's license, flight line flag, flight line Yellow flashing light.

Speed limit in all fire lanes, parking lots, and hangar areas is 5 mph!

2. IDENTIFICATION

All personnel working at the Corpus Christi Army Depot must wear a government issued identification pass.

Pass is obtained through your CCAD contract representative. The pass may be removed while working at the actual job site but MUST BE WORN in plain view when away from the job site.

Walking through the depot away from the job site without an identification pass is a violation of security regulations.

3. VISITORS

Contract personnel are to clear all visitors through their COR, the COR is the only person authorized to sponsor through the Commanders Office, and sign in visitors.

All personal visitors not related to the job must be cleared, sponsored and signed in through Security.

4. GOVERNMENT PROPERTY

Government phones are for official use only.
Use of phones without permission, making personal, long distance calls are prohibited.

Telephone calls are not to exceed 5 minutes.
Pay phones are located through out the CCAD Complex.

All photographic, video equipment must be cleared through your contract representative and Security.

Opening, blocking doors, and entering non-job related areas without permission or clearance.
Removing tools or other government equipment without proper permission is not permitted.
Government buildings and property will not be left unattended and unsecured.

CCAD Security is to be notified on all emergencies, accidents, disturbances, etc. or requests for Security related assistance.

CCAD Security will respond or make the appropriate calls for Proper authorities.

NOTICE:

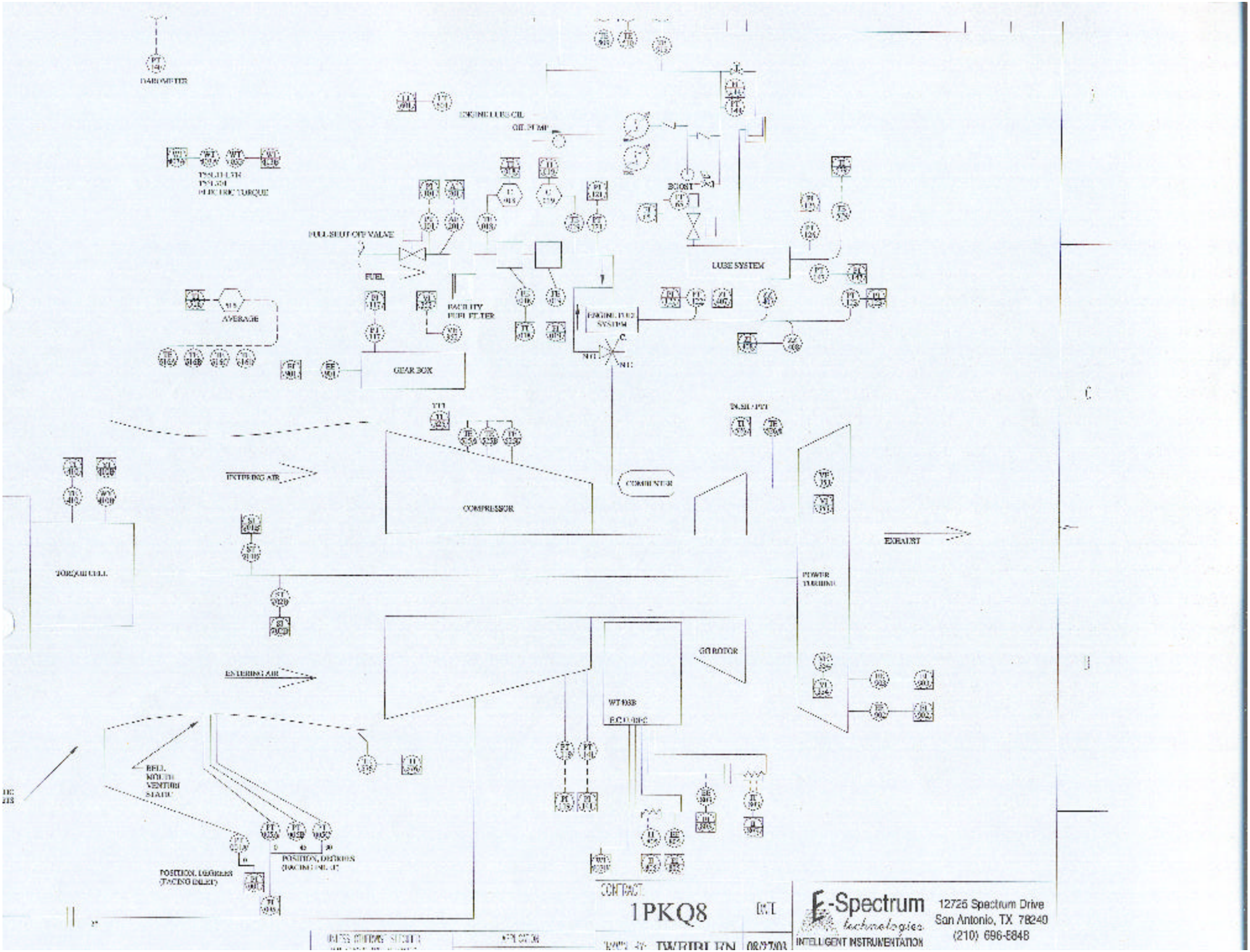
This document is a brief overview of directives applicable on the NAS Corpus Christi Naval Air Station and Corpus Christi Army Depot.

For further clearance or guidance refer to the numbers listed.

CCAD SECURITY: 939-3313
NAS POLICE: 939-2480

Supercedes 2001

//////SIGNED//////
NORBERTO A. SANCHEZ
SECURITY OFFICER,CCAD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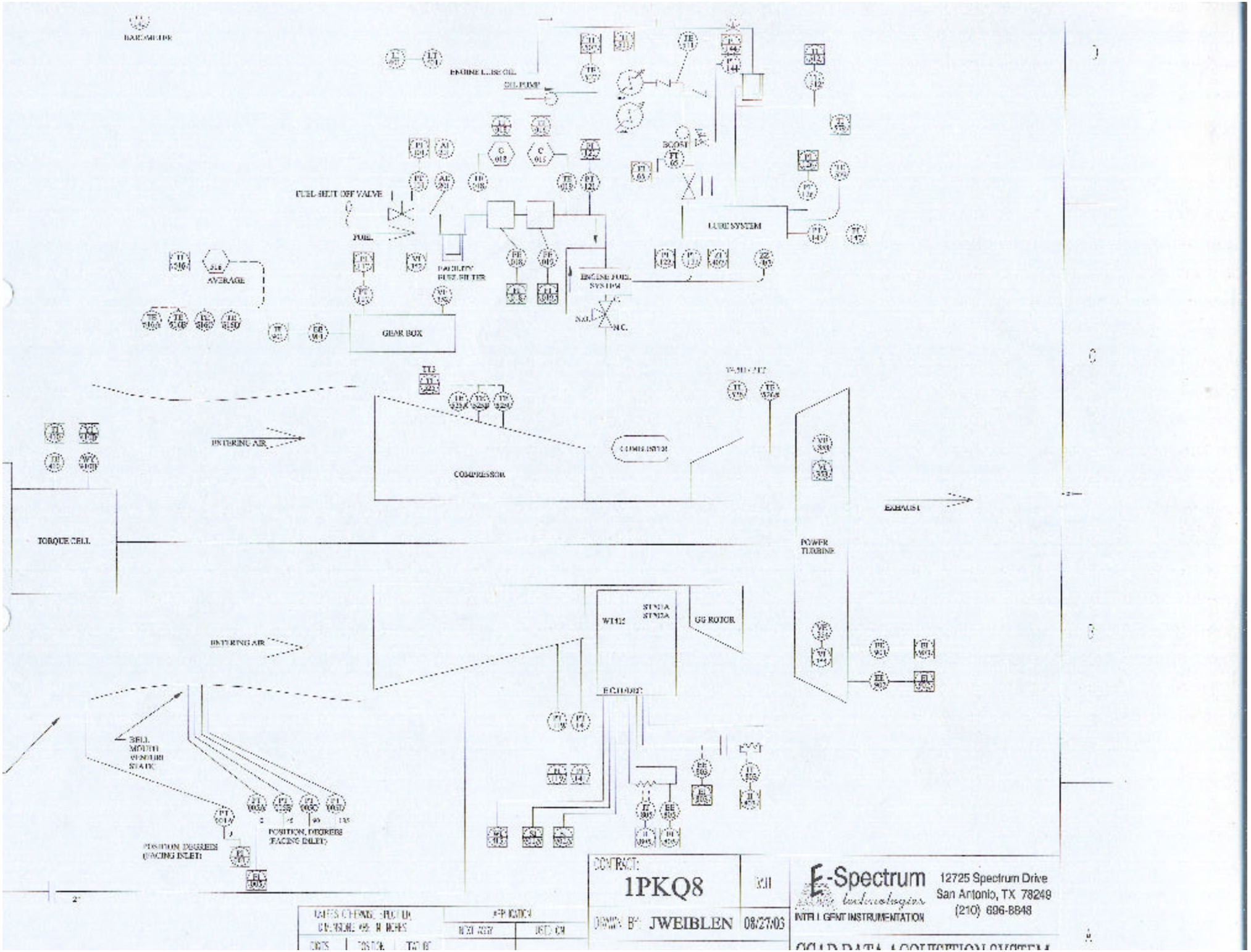
TORQUE
ELECTRIC TORQUE
BOOST
FULL SHUT OFF VALVE
FUEL
AVERAGE
FACILITY FUEL FILTER
ENGINE FUEL SYSTEM
LUBE SYSTEM
GEAR BOX
INTERING AIR
COMPRESSOR
COMBUSTOR
EXHAUST
POWER TURBINE
GG ROTOR
ENTERING AIR
BELL MOUTH VENTURI STATIC
POSITION, DEGREES (FACING INLET)
POSITION, DEGREES (FACING INLET)
CONTRACT
1PKQ8
E-Spectrum technologies
INTELLIGENT INSTRUMENTATION
12725 Spectrum Drive
San Antonio, TX 78240
(210) 696-8848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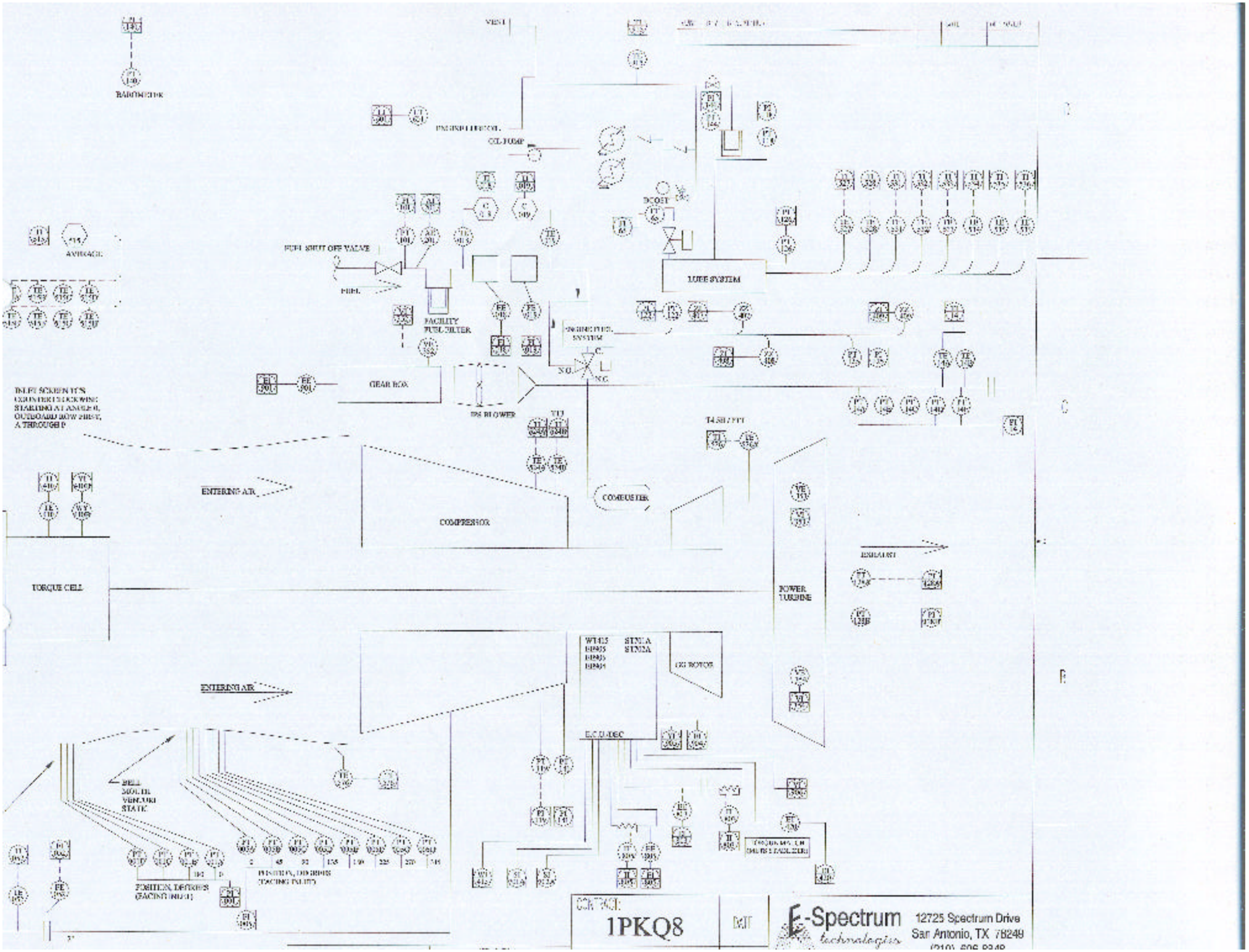
BOOST
LUBE SYSTEM
TT3
ENTERING AIR
COMPRESSION
COMBUSTION
EXHAUST
TORQUE CELL
POWER TURBINE
WT412
ST413A
ST412A
GG ROTOR
ENTERING AIR
BELL MOUTH VENTURI STATIC
POSITION, DEGREES (FACING INLET)
POSITION, DEGREES (FACING INLET)
CONTRACT:
1PKQ8
DRAWN BY: JWEIBLEN 08/27/03
E-Spectrum technologies
INTELLIGENT INSTRUMENTATION
12725 Spectrum Drive
San Antonio, TX 78249
(210) 696-8848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LUBE SYSTEM
ENGINE FUEL SYSTEM
N.O.
N.C.
GEAR BOX
IPS BLOWER
T3
T4.5/T/PT
ENTERING AIR
COMPRESSOR
COMBUSTER
EXHAUST
TORQUE CELL
POWER TURBINE
WT415
ST415A
ST412A
GG ROTOR
E.C.U./EEC
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POSITION, DEGREES (FACING INLET)
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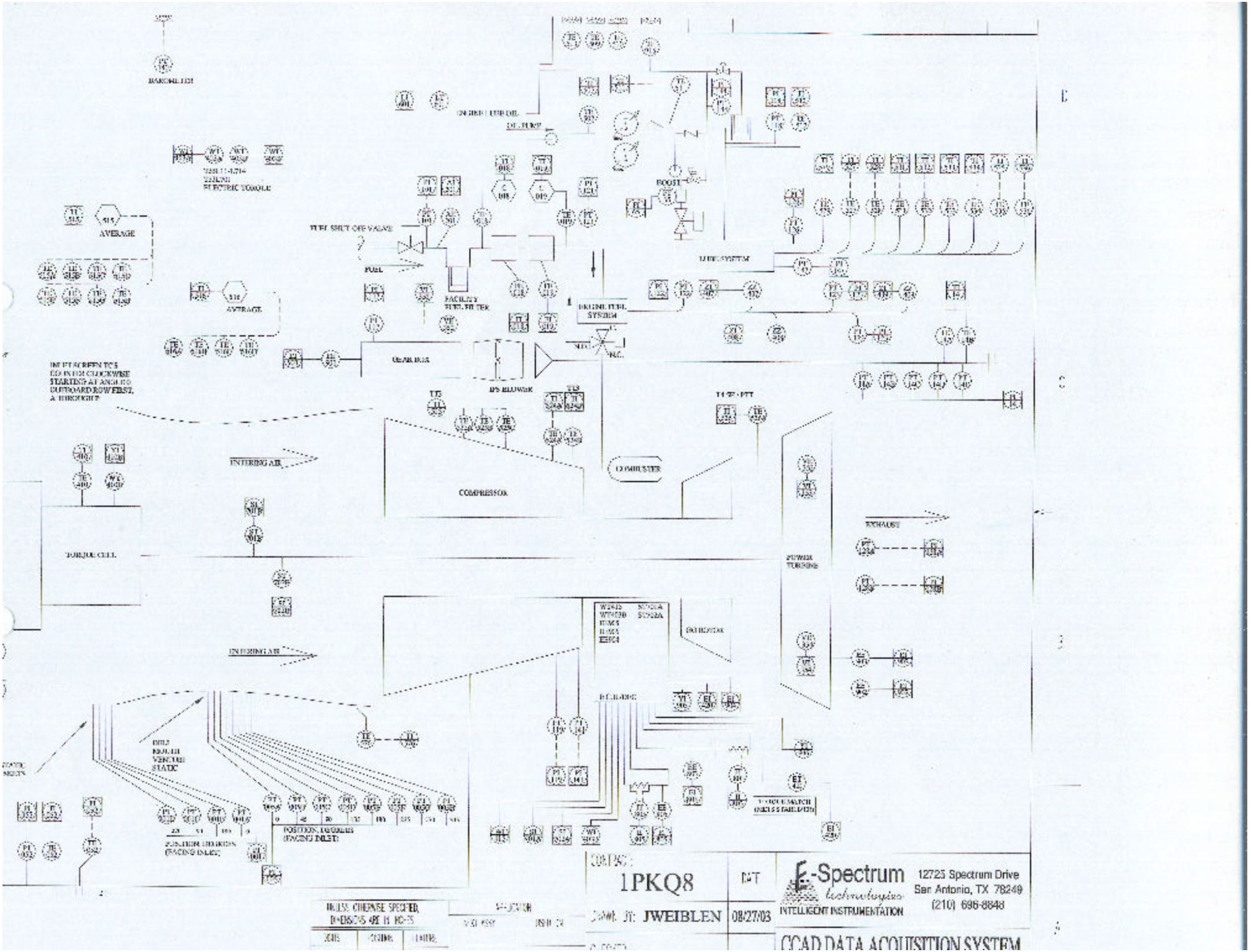
1PKQ8
E-Spectrum technologies
12725 Spectrum Drive
San Antonio, TX 78249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FUEL SHUT OFF VALVE
FUEL
FACILITY FUEL FILTER
ENGINE FUEL SYSTEM
GEAR BOX
AVERAGE
INLET SCREEN TCS COUNTED CLOCKWISE STARTING AT ANGLE TO OUTBOARD ROW FIRST, A THROUGH F
INTERING AIR
COMPRESSOR
COMBUSTER
TORQUE CELL
EXHAUST
POWER TURBINE
INTERING AIR
POSITION, DEGREES (FACING INLET)
1PKQ8
DWN. BY: JWEIBLEN
08/27/03
E-Spectrum technologies
INTELLIGENT INSTRUMENTATION
12725 Spectrum Drive
San Antonio, TX 78249
(210) 696-8848
CCAD DATA ACQUISITION SYSTEM

Tag #	Used On	Signal Name
148	C	GEARBOX PRESSURE
150	ABC	W/B LUBE OIL SUPPLY PRESSURE
152	B	POWER TURBINE BEARING OIL SCAV NEG PRESS
	C	BEARING 4&5 OIL SCAVENGE NEGATIVE PRESSURE
201	ABC	FUEL SPECIFIC GRAVITY
202	ABC	ABSOLUTE HUMIDITY
351	ABC	VIBRATION CHANNEL NO. 1
352	ABC	VIBRATION CHANNEL NO.2 (GearBox / IPX)
353	ABC	VIBRATION CHANNEL NO.3 (High Aft)
354	ABC	VIBRATION CHANNEL NO.4 (Low Aft)
356	ABC	VIBRATION CHANNEL NO. 6 (Water Purrp)
403	B	T55L712 ENGINE TORQUE
407	A	LOAD DEMAND SPINDLE (LDS)
	B	POWER LEVER POSITION
	C	ENGINE CONTROL LEVER POSITION
408	AB	POWER AVAILABLE SPINDLE (PAS)
409	A	STAGE 1 VANE ANGLE
410	ABC	W/B STRAINGAGE
415	A	T700 ENGINE TORQUE
	C	T55GA714A ENGINE TORQUE
420	A	TORQUE MATCH INPUT INDICATION
501	ABC	ENGINE EXHAUST TEMP. RAKE (6 TCs)
507	C	OIL COOLER INLET TEMP
509	BC	TURBINE SCAV. OIL TEMP.
510	BC	#2 BEAR. SCAV. OIL TEMP.
511	C	OIL COOLER OUT TEMP.
512	C	ENGINE OIL OUT TEMP.
513	C	OIL CAL. LOOP TEMP.
515	A	INLET AIR TEMP. (T0)
516	BC	INLET AIR TEMP.(T55) (T0)
524	A	COMP. DISC. TEMP. (T700) (T3)
525	BC	COMP. DISC. TEMP. (155) (T3)
526	ABC	POWER TURBINE INLET TEMP (T4.5H / PTT)
527	A	OIL SCAV. TEMP. B-SUMP FWD
528	A	ENGINE OIL DISC. TEMP. (EODT)

Tag #	Used On	Signal Name
531	A	OIL SCAV. TEMP. A-SUMP FWD
532	A	OIL SCAV. TEMP. A-SUMP AFT
533	A	OIL SCAV. TEMP. B-SUMP AFT
534	A	OIL SCAV. TEMP. C-SUMP FWD
535	A	OIL SCAV. TEMP. C-SUMP AFT
536	A	OIL SCAV. TEMP. AUX GEARBX
566	ABC	W/B Rear Bearing Oil ScavangeTemp. No 1
569	ABC	W/B Rear Bearing Oil ScavangeTemp. No 2
570	ABC	W/B Forward Bearing Oil Scavenge Temp.
571	ABC	W/B WATER IN TEMP.
572	ABC	W/B WATER OUT TEMP.
573	ABC	COOLING TWR BASIN H-20 TEMP.
576	A	ENGINE ANTI-ICE TEMP.
578	BC	ENGINE OIL TEMP. BULB
601	ABC	FAC LUBE OIL LEVEL (PRES)
602	ABC	COLD WATER LEVEL
701A	A	Np FOR T700 ENGINES
	C	NPT FOR T55GA714A ENGINES
701B	B	N2 FOR T556712 ENGINES
702A	A	Ng FOR T700 ENGINES
	C	NGG FOR T55GA714A ENGINES
702B	B	N1 FOR T55L712 ENGINES
703	A	NP DEMAND
	C	N2 SET KNOB
803	ABC	400Hz Power Supply On/Off Control
805	ABC	Ignition Voltage On/Off Control
901	ADC	GEARBOX CHIP DETECTOR
902	BC	POWER TURBINE OIL SCAVENGE DETECTOR
903	BC	NO. 2 BEARING OIL SCAVENGE DETECTOR
904	A	ANTI-ICING BLEED AND START VALVE IND
905	A	OIL FILTER BYPASS INDICATION
906	A	FUEL FILTER BYPASS INDICATION
907	ABC	OVERSPEED TEST SWITCH #1
908	ABC	OVERSPEED TEST SWITCH #2
915	ABC	HYD SYSTEM TEMP ALARM

Sequence

000-099	Flow Measurement Channels
0100-0199	Pressure Measurment Channels
0200-0299	Not Used
0300-0399	Vibration Measurmenr Channels
0400-0499	Torque Measurment Channels
0500-0599	Temperature Measurment Channels
0600-0699	Fluic Level Measurment Channels
0700-0799	Frequency/Period Measurment Channels
0800-0899	Discrete Inputs Channels
0900-0999	Discrete Output Channels

Used On Code

A	GE T700 Series Engines
B	Honeywell T55-L712 Engines
C	Honeywell T55-GA-714A Engines

CONTENT:
1PKQ8

DRAWN BY JWEIBLEN 08/27/03

E-Spectrum technologies
INTELLIGENT INSTRUMENTATION

12725 Spectrum Drive
San Antonio, TX 78249
(210) 696-8848

CCAD DATA ACQUISITION SYSTEM

CONTRACT DATA REQUIREMENTS LIST
(2 Data Items)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP ____ TM ____ OTHER ____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Engine Test Cell Capacity Upgrade		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A001	PROJECT MANAGEMENT PLAN (PMP)		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW PARA GRAPH C1.1.1.	AMSAM-CC-ES-EE

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	9. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ONCE	14 Days After Contract
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
See Block 16	0	5	0
15. TOTAL →	0	5	0

16. REMARKS

The PMP shall detail the approach to managing the project from design to certification and shall include technical, cost, and schedule performance.

Block 14a:
Commander
AMSAM-CC-ES-EE (Attn: Michael Reed)
Corpus Christi Army Depot
308 Crecy Street5 MS 30
Corpus Christi, TX 78419-5260

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A002	SYSTEM STATUS REPORTS		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		Monthly	See Block 16
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A			See Block 16

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
See Block 16		2	
15. TOTAL →		2	

16. REMARKS

Block 12 & 13: Provide report in electronic format 30 days after completion of project. Thereafter, provide report every 30 days for the duration of the contract and warrenty periods including any option periods if utilized.

Block 14a:
Commander
AMSAM_CC_ES_EE (Attn: Michael Reed)
Corpus Christi Army Depot
308 Crecy Street MS 30
Corpus Christi, TX 78419-5260

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
Mark Stefanowicz	06/21/04		6/21/04

CONTRACT DATA REQUIREMENTS LIST
(2 Data Items)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP _____ TM- _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Engine Test Cell Capacity Upgrade		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A003	CONFERENCE MINUTES		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW PARAGRAPH C3.2.1.1.	AMSAM-CC-ES-EE

7. DD 250 REQ	8. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		See Block 16	See Block 16
9. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A	See Block 16	N/A	As Required

16. REMARKS

Block 10: As required for the Presubmittal Conference, Preliminary Design Review, Critical design Review and In-Process Review Conferences.

Block 12: Contractor shall submit the conference minutes to the government within 14 days after each conference.

Block 14a::
Commander
AMSAM-CC-ES-EE (Attn: Michael Reed)
Corpus Christi Army Depot
308 Crecy Street MS 30
Corpus Christi, TX 78419-5260

14. DISTRIBUTION	b. COPIES		
a. ADDRESSEE	Draft	Final Reg	Final Repro
See Block 16	5	5	0
15. TOTAL →	5	5	0

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A004	CONFERENCE AGENDA	See Block 16	18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW PARAGRAPH C3.2.1.1.	AMSAM-CC-ES-EE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		See Block 16	See Block 16
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		N/A	As Required

16. REMARKS

Block 3: For Presubmittal Conference, shall consist of: a) draft list of major equipment, b) list of proposed exceptions to the SOW, c) a flow chart showing the steps to be taken in preparing and coordining each submittal to the government, d) a Gantt chart schedule for all activities from the Start of Work Conference through startup and training.
Block 10: As required for the Preliminary Deasign Review, Critical Design Review, and In-Process review conferences.
Block 12: Contractor shall submit the conference agenda to the government 14 calendar days prior to the conference.
Block 14a: Commander
AMSAM-CC-ES-EE (Attn: Michael Reed)
Corpus Christi Army Depot
308 Crecy Street, MS 30, Corpus Christi, TX 78419-5260

14. DISTRIBUTION	b. COPIES		
a. ADDRESSEE	Draft	Final Reg	Final Repro
See block 16	5	5	0
15. TOTAL →	5	5	0

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
Mark Stefanowicz	6/21/04		6/21/04

DD Form 1423-2, JUN 90
1059/183

Previous editions are obsolete.

Enclosure (6)

CONTRACT DATA REQUIREMENTS LIST
(2 Data Items)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP _____ TM- _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Engine Test Cell Capacity Upgrade		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A005	PROJECT SCHEDULE		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW PARAGRAPH C3.2.2	AMSAM-CC-ES-EE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14. DISTRIBUTION
LT			See Block 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	**a. ADDRESSEE** / **b. COPIES** (Draft; Final: Reg, Repro)
N/A		N/A	See Block 16	

16. REMARKS

Block 12: The contractor shall provide an overall project schedule within 30 days of project start.. The government will provide comments to the contractor within 14 days. An agreed to schedule will be produced within 60 days of project start. Schedules shall be provided in Microsoft Project.
Block 13: Project progress will be tracked, recorded, and reported weekly by the contractor against the baseline. No more often then monthly, the baseline schedule may be adjusted to incorporate agreed to changes.
Block 14a:
Commander
AMSAM-CC-ES-EE (Attn: Michael Reed)
Corpus Christi Army Depot
308 Crecy Street MS 30
Corpus Christi, TX 78419-5260

a. ADDRESSEE	b. COPIES: Draft	Final: Reg	Final: Repro
See Block 16	5	5	0
18. TOTAL →	5	5	0

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A006	PROGRESS REPORTS		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW PARAGRAPH C3.2.2.	AMSAM-CC-ES-EE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION	14. DISTRIBUTION
LT		WEEKLY	See Block 16	
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**	**a. ADDRESSEE** / **b. COPIES** (Draft; Final: Reg, Repro)
N/A		N/A	See Block 16	

16. REMARKS

Block 12: Contractor shsll provide Progress Reprts within7 days of project start.
Block 13: Project progress will be tracked, recorded, and reported weekly by the contractor against the baseline.

Block 14a:
Commander
AMSAM-CC-ES-EE (Attn: Michael Reed)
Corpus Christi Army Depot
308 Crecy Street MS 30
Corpus Christi, TX 78419-5260

a. ADDRESSEE	b. COPIES: Draft	Final: Reg	Final: Repro
See Block 16	5	5	0
18. TOTAL →	5	5	0

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
Mark Stefanowicz	6/21/04		6/21/04

DD Form 1423-2, JUN 90
1058/183

Previous editions are obsolete.

Enclosure (6)

CONTRACT DATA REQUIREMENTS LIST
(2 Data Items)

Form Approved
OMB No. 0704-0188

A. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP _____ TM _____ OTHER _____

D. SYSTEM / ITEM	E. CONTRACT / PR NO.	F. CONTRACTOR
Engine Test Cell Capacity Upgrade		

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A007	TEST ACCEPTANCE SOFTWARE		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW PARAGRAPH C3.3.7	AMSAMK-CC--ES-EE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		ONCE	See Block 16
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		N/A	None

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final Reg	Final Repro
See Block 16	0	2	0
16. TOTAL →	0	2	0

15. REMARKS

Block 12: Upon completion of system installation, Contractor shall provide test acceptance software that measures engine and engine module performance against established DMWR rating criteria.

Block 14a:
Commander
ASSAM-CC-ES-EE (Attn: Michael Reed)
Corpus christi Army Depot
308 Crect Street MA30
Corpus Christi, TX 78419-5260

1. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A008	SOURCE CODES, FIRMWARE, SOFTWARE		18. ESTIMATED TOTAL PRICE

4. AUTHORITY (Data Acquisition Document No.)	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
	SOW PARAGRAPH C3.10.5	AMSAMK-CC--ES-EE

7. DD 250 REQ	9. DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT		Once	See Block 16
8. APP CODE		**11. AS OF DATE**	**13. DATE OF SUBSEQUENT SUBMISSION**
N/A		N/A	None

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final Reg	Final Repro
See Block 16	0	2	0
16. TOTAL →	0	2	0

15. REMARKS

Block 12: Within 30 days of acceptance, contractor shall provide hard copies of all system source code, firmware, software used in the system as well as one set of backup software for all programmable components within the system.

Block 14a:
Commander
ASSAM-CC-ES-EE (Attn: Michael Reed)
Corpus christi Army Depot
308 Crect Street MA30
Corpus Christi, TX 78419-5260

G. PREPARED BY	H. DATE	I. APPROVED BY	J. DATE
Mark Stefanowicz	6/21/04		6/22/04

ATCH No__1__TO EXHIBIT_A_ | CONTRACT DATA REQUIREMENTS LIST | System/Item

CONTRACT N00140-01-D-K011 or K01 | CATEGORY | DELIVERY ORDER (DO) | Contractor

1 Sequence NUMBER	2 TITLE OR DESCRIPTION OF DATA 3 SUBTITLE	6 TECHNICAL OFFICE	10 Frequency	12 DATE OF 1ST SUBMISSION	14 DISTRIBUTION & ADDRESSEES (Addressee-Regular Copies/Repro Copies)
4 AUTHORITY (DID)	5 CONTRACT REFERENCE	7 DD250 REQ / 8 APP CODE / 9 IAC INPUT	11 AS OF DATE	13 Date Subsequent SUBMEVENT ID	
1 A005	System Drawing Installation	6 NAVSEALOGCEN	10 One Time	12 See Block 16.	14 Commander AMSAM-CC-ES-EE (Attn: gary Richmer) Corpus Christi Army Depot 308 Crecy Street M30 Corpus Christi, TX 78419-5260
4	5 SOW PARA C3.10.2	7 LT / 8 N / 9	11	13 None	15 TOTAL one original, two copies
16 REMARKS Block 12: Provide within 30 days of system acceptance. Block 14: Provide drawings in "C" size hard copy & floppy disk or CD media as AutoCAD ".dwg" files, release 14.					
1 A006	System Drawing As-Builts	6	10 One Time	See Block 16.	14 Commander AMSAM-CC-ES-EE (Attn: gary Richmer) Corpus Christi Army Depot 308 Crecy Street M30 Corpus Christi, TX 78419-5260
4	5 SOW PARA C3.10.2	7 LT / 8 N / 9	11	13 None	15.TOTAL one original, two copies
16 REMARKS Block 12: Provide within 30 days of system acceptance. Block 14: Provide drawings in "C" size hard copy & floppy disk or CD media as AutoCAD ".dwg" files, release 14.					
1 A007	System Drawings Vendor Information	6	10 One Time	12 See Block 16.	14 Commander AMSAM-CC-ES-EE (Attn: gary Richmer) Corpus Christi Army Depot 308 Crecy Street M30 Corpus Christi, TX 78419-5260
4	5 SOW PARA C3.10.3 LT	8 N / 9		13 None	15 TOTAL one original, two copies
16 REMARKS Block 12: Provide within 30 days of system acceptance. Block 14: Provide drawings in "C" size hard copy & floppy disk or CD media as AutoCAD ".dwg" files, release 14.					
A008	System Manuals Operation Manual	6	10 One Time	12 See Block 16.	14 Commander AMSAM-CC-ES-EE (Attn: gary Richmer) Corpus Christi Army Depot 308 Crecy Street M30 Corpus Christi, TX 78419-5260
4	5 SOW PARA C3.10.4.1	7 LT / 8 N / 9	11	13 None	15 TOTAL one original, two copies
15 REMARKS Block 12: Provide within 30 days of system acceptance. Block 14: Provide manuals in hard copy & floppy disk/ CD format(either ASCII or Microsoft Word 97 or higher).					

PREPARED Mark A. Stefanowicz | DATE 06/18/18 | APPROVED BY D. Vandeveer | DATE 6/21/04

DD 1423

ENCLOSURE (G)

ATCH No. 1 TO EXHIBIT A | **CONTRACT DATA REQUIREMENTS LIST** | System/Item

CONTRACT N00140-01-D-K011 or K01: | CATEGORY **DELIVERY ORDER (DO)** | Contractor

1 Sequence NUMBER	2 TITLE OR DESCRIPTION OF DATA 3 SUBTITLE	6 TECHNICAL OFFICE			10 Frequency	12 DATE OF 1ST SUBMISSION	14 DISTRIBUTION & ADDRESSEES (Addressee-Regular Copies/Repro Copies)
4 AUTHORITY (DID)	5 CONTRACT REFERENCE	7 DD250 REQ	8 APP CODE	9 IAC INPUT	11 AS OF DATE	13 Date Subsequent SUBM/EVENT ID	
1 A009	System Manuals Operations Manual Volume 2	6 NAVSEALOGCEN			10 One Time	12 See Block 16.	14 Commander AMSAM-CC-ES-EE (Attn: Gary Richmer) Corpus Christi Army Depot 308 Crosy Street MS 30 Corpus Christi, TX 78419-5280
4	5 SOW PARA C3.10.4.2	7 LT	8 N	9	11	13 None	15 TOTAL one original, two copies
16 REMARK Shall contain calibration and maintenance information. Block 12: Provide within 30 days of system acceptance. Block 14: Provide manuals in hard copy & floppy disk/CD format (either ASCII or Microsoft Word 97 or higher).							
1 A010	System Manuals Operations Manual Volume 3	6 NAVSEALOGCEN			10 One Time	See Block 16.	14 Commander AMSAM-CC-ES-EE (Attn: Gary Richmer) Corpus Christi Army Depot 308 Crosy Street MS 30 Corpus Christi, TX 78419-5280
4	5 SOW PARA C3.10.4.3	7 LT	8 N	9	11	13 None	15 TOTAL one original, two copies
16 REMARK Shall contain control system operation and maintenance instructions. Block 12: Provide within 30 days of system acceptance. Block 14: Provide manuals in hard copy & floppy disk/CD format (either ASCII or Microsoft Word 97 or higher).							
1		6			10	12	
4	5		8	9		13	15 TOTAL
16 REMARKS							
		6			10	12	14
4	5	7	8	9	11	13	15 TOTAL
16 REMARKS							

PREPARED Mark A. Stefanowicz | DATE 06/18/18 | APPROVED BY D. Vandeusen | DATE 6/21/04

DD 1423

ENCLOSURE (G)

FIRM FIXED PRICE SUPPLY CONTRACT WITH PROVISIONS FOR MAINTENANCE OR ACCEPTANCE TESTING CRITERIA OR OTHER PROVISIONS WHICH REQUIRE UNUSUAL MONITORING AND A COR

CONTRACT ADMINISTRATION PLAN
CONTRACT NO. N00174

In order to expedite administration of this contract, the following delineation of duties is provided. The individual/position designated as having responsibility should be contacted for any questions, clarifications, or information regarding the functions assigned.

1. PROCURING CONTRACTING OFFICER (PCO) is responsible for:

a. All pre-award information, questions, or data.
b. Freedom of Information inquiries
c. Change/questions/information regarding the scope, terms or conditions of the basic contract document.
d. Arranging the post award conference
e. Monitoring of the COR
f. Meeting annually with COR to review contract performance (joint responsibility of the COR). This may be satisfied telephonically, depending on the circumstances.

Other _____
_____

2. CONTRACT ADMINISTRATION OFFICE (CAO) is responsible for matters specified in FAR 42.302 and DFARS 242.302 except in those areas otherwise designated herein.
_____

3. PAYING OFFICE is responsible for payment of approved proper invoices after acceptance is documented.

4. CONTRACTING OFFICER'S REPRESENTATIVE (COR) is responsible for:

a. Controlling all government technical interface with the contractor and providing technical advice and clarifications of the specifications/ statement of work.

b. Providing copies of all government/contractor technical correspondence to the PCO.

c. Promptly furnishing the PCO with documentation/comment on any request for change, deviation or waiver (whether generated by the government or the contractor).

d. Assuring that equipment is delivered on time, and promptly notifying the PCO if any contractor delay in delivery is experienced.

e. If applicable, coordination of site preparation and installation to the extent specified in the contract as the government's responsibility.

f. Quality assurance, inspection and acceptances of supplies, or services (if applicable).

g. If applicable, monitoring standard of performance testing or effectiveness level acceptance criteria.

h. If applicable, monitoring of credits, such as downtime credits for maintenance if provided for in the contract, and making appropriate adjustments on contractor reimbursement.

i. Promptly reviewing the contractor's invoices for goods/services received and accepted, to assure that they conform to the contract pricing. Improper invoices shall be returned immediately to the contractor. Proper correct invoices and/or DD250's, as applicable shall be approved and forwarded to the paying office.

j. Maintain a COR file of all correspondence with the PCO and contractor and copies of all invoices.

k. Meeting annually with the PCO to review contract performance, this may be satisfied telephonically, depending upon the circumstances.

l. Complying with SECNAVINST 4200.27A "Proper Use of Contractor Personnel", NAVSEAINST 4200.17B and SECNAVINST 4205.5 "Contracting Officer's Technical Representative" and the Contracting Officer's COR Appointment Letter.

m. Submission of written report on contractor performance within 60 days of contract completion, but not less often than annually.

n. Anticipating and submitting requests for follow-on contract requirements in sufficient time to allow for award prior to the expiration of this contract.

o. Contract Performance Assessment System (CPARS).

( ) This contract WILL be registered in the CPARS database by the Contracts Division with the assistance of the COR. As stated in the COR appointment letter the COR is responsible for updating the CPARS database.

( ) CPARS does NOT apply to this contract.

Other: _____
_____

NAMES/ADDRESS/TELEPHONE NUMBERS OF COGNIZANT INDIVIDUAL/OFFICE

COR_____
NAME CODE TELEPHONE

PCO (refer to Contracting Officer who signed contract documents)
_____
CODE TELEPHONE
PAYING OFFICE (refer to page one of the contract document)
CAO (refer to page one of the contract document)